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International Interlocking

FROM its beginnings rubber manufacture has been international rather than national. The founders after starting factories in their own countries built others for their neighbors. And so it has progressed until at the present day British companies have plants in the United States, Argentine, Australia, Canada, France, Japan, and other European and Asiatic centers. Germany established factories in England, France, and the United States. France did the same in the United States and Russia. Italy built factories in England and Spain, and so on. Nor has the United States been free from such "foreign entanglements." Nearly a hundred years ago American factories were projected in Canada, England, France, and later in Russia. With the vast and sudden growth of American rubber manufacture the big corporations were at first content to enlarge their home plants, with an occasional subsidiary built or purchased to fill the needs of distant home markets, and to acquire fabric mills and accessory plants for their own pressing needs. But of late comes the impulse for further reaching into distant fields. Thus we have great American rubber plantations in the Dutch Indies, in British Malaya, and even in Africa, newly acquired rubber factories in France, England, Germany, Japan, and Canada, with rumors of more to follow.

With such a history of fraternal interchange of industrial interlocking it would almost seem as if an International Rubber Association was about due. Certainly much could be done in general standardization, in study of tariffs, and, perhaps, arrangements to the end that both those who supply crude rubber and those who use it reap a fair and constant reward for their labors.

Progress in Continuous Production

CONTINUOUS production, that is, a series of machines and mechanical devices that do away with hand work, except for a few machine tenders, is the ambition of present day rubber manufacturers. Or more accurately, it has been the aim of the thinkers for more than a quarter of a century. The dawnings of this desire, that is, in concrete form, took shape years ago in an English automatic machine. Standing beside a mixer, it received compounded stock, molded it into shape, vulcanized and delivered semi-hard black rubber stoppers quite ready for packing and shipment. If memory is not at fault, there was also an automatic counting attachment at the point of delivery. Then, too, there was the apparatus for coating cloth, recovering the solvent, vulcanizing the rubbered surface, measuring and wrapping; also British. Since then there has been constant but somewhat erratic progress toward complete mechanical processes. Tires, footwear and heels, because of urgent market needs and strong competition, have shown the most notable progress. All told, while much has been done it is probable that inventors are far from reaching the goal of their desires. No doubt the day will dawn when a bit of rubber fed into a machine will emerge a tiny vulcanized golf ball center filled with liquid dope. This will be delivered automatically to a winder, where rubber thread formed and vulcanized by another self-tending apparatus will proceed to wind itself at the desired tension to the required thickness. Released by an almost human mechanism the ball will traverse a narrow runway picking up strips of gutta percha sufficient for its

cover. Dropping into rotary press rolls it will be molded, pebbled, weighed, counted and tested. The perfect balls will continue their journey to be wrapped, packed, and labeled, all by self-running, self-tending and self-salaried machinery.

The best part of the situation is that the ancient prejudice and hatred on the part of labor toward work saving machines has practically disappeared. Indeed, workmen are at the forefront of the movement, with suggestion and invention. Thus capital and labor work together.

Typhoons and Rubber Planting

All those who know either the Philippines or rubber planting or both also know A. W. Prautch. He it is who more consistently than any other has preached rubber planting in the Philippines; has experimented, and studied climate, rainfall, product and everything that tends to the successful culture of the Hevea.

Some thirteen years ago under the auspices of the government he secured 40,000 rubber seeds from Singapore and planted them, not in the Southern Islands or Mindanao, where everybody knew rubber would grow, but in the Camarines and Albay provinces in Luzon where the experts said they would not grow. These seeds were distributed to the caretakers of distant hemp plantations. Of course they were carelessly planted, that is, experts were lacking, and the native foremen did their best.

Last year Mr. Prautch visited the areas, cut paths through the jungle and looked for the trees. In one place he found over 600 trees over 20 inches in circumference 3 feet above the ground. The largest of these trees was 39 inches in circumference and the guides said further on there were still larger trees and that they numbered at least 2,000. These had seeded and he counted 108 small rubber trees under one of the large ones. The self-planted trees were healthy and flourishing. This is in what is called the "typhoon region" and Mr. Prautch thus disposes of the high wind bogey.

He says: "It is absolutely certain that our rubber trees will stand any storm; the branches will not break; the trees sway in the strongest storm like bamboos. The 1,000 or more trees planted in an exposed situation actually have weathered at least six typhoons which swept over Albay and Sorgoyo provinces, so that this is founded on fact. The yarn of the Pará rubber tree not growing well in the typhoon belt is a myth passed on until believed. The matured Pará trees in Putiao refute this undoubted untruth. I further state that where hemp will thrive, there Pará will do well. The humidity in the air, good drainage and soil are the important factors. Thousands of hectares in the Bicol region and as far up the Tayabos province as Infanta are available."

This report was deemed so important that Governor General Wood sent it to the War Department with the suggestion that it at once be given to the press and to the rubber journals in particular. To those who look with favor on rubber planting in the Philippines it will be of particular interest, as it makes planting possible in new and accessible areas where plenty of labor is constantly available.

The eminent Secretary of the British Engineering Standards Association deplores the term "Standardization," and suggests "Unification" as being more elastic and not giving so pronouncedly the idea of rigidity or crystallization. The producers of chairs and tables uniformly make a chair-seat 17 inches high, a table-top 29 inches high. In the days when furniture builders followed their own ideas, based upon the architectural abnormalities of their best customers, either term would have made little difference. Nor today is it certain that it would be less difficult to un-standardize than to un-unify, once a fanatical following of rigid standards had gone too far. Not that the new name is amiss. It will indeed draw fresh attention to the general need of industrial standardization—or unification.

It is disappointing that none of the bright minds in the rubber realm have waked to the infinite possibilities of the cross-word puzzle. Take, for example, "Stevenson" for the vertical and "Firestone" for the horizontal key words. Cross them at the second "E" in Stevenson and the first "E" in Firestone. Then build into the adjacent squares words that are for or against restriction, according to the faith of the builder. What an opportunity to get one's belief under the epidermis of the opposition!

The most costly form of competition with which the rubber industry has to contend is ignorance of the first principles of uniform cost accounting. This is frequently evidenced in competition bids and the conclusion is that many manufacturers have little or no idea of costs and make prices lower than the costs of materials. Legitimate competition is a spur to greater effort but ignorance is something unknown, against which there is no real defense.

The methods of goods distribution are changing. Formerly the consumer sought the merchandise and the whole distribution system—retailers, wholesalers and manufacturers—was designed to supply the consumer needs. Now, however, the balance is shifting. Merchandise seeks the consumer. The distributer hunts him up and gives him what he needs and what he wants. Department and chain stores sell everything, from rubber gloves to tires, and the consumer is the magnet.

Beloved, I wish above all things that thou mayest prosper and be in health, even as thy soul prospereth. III John 1; 2.

Rubber Pavement for Public Roads[1]

Rubbered Asphalt—Some Applications—Rubbered Concrete—Mastic-Colloid for Monolithic Covering—Rubber Treated Colloid Macadam

THE methods of surfacing roads which have been patented[2] by Dr. de Caudemberg, France, have given undeniable proof of their value. Three types of road surfaces have been the result of his research. They are rubbered asphalt, rubbered concrete and colloid macadam. These surfaces are based on the principle that materials whose resistance is determined by their resilience and elasticity are likely to solve the problem of modern roads. Asphalt, bitumen, coal tar and oil tar have these qualities, but they do not remain in the pavement after a certain time.

THE perfection of a practical rubber pavement for public streets and roads seems imminent. For many years rubber inventors and chemists have worked sedulously to that end. The rubber paving, invented by Dr. de Caudemberg, and here described, marks a broad stride toward the ultimate object. Pavements laid in Cannes and Monaco, France, more than twelve years ago and exposed to heavy traffic show little wear and indicate much longer service.

In order to prevent this disappearance of qualities, which leads to the destruction of the pavement it is necessary to obtain certain combinations between these materials and others in a way which will increase these qualities and result in practically indefinite enduring stability. It has been found that the combination of rubber with the bituminous materials mentioned above will increase the qualities of these materials to a great degree.

Dr. de Caudemberg has continued his studies without interruption for many years and his processes have undergone many important improvements which increase their value, as described in successive patents.

Rubber has a great affinity for all bitumens and naphthas. In a mutual solvent they combine in definite proportions and produce a new body of different qualities, practically of an unalterable stability. After the volatilization of the solvent the final product possesses, besides its own, certain attributes of the rubber. It is supple, resistant, impermeable, waterproof, very cohesive, not affected by any temperature changes and it preserves indefinitely its compressibility. Therefore it is eminently fitted to be employed as a covering or a binder in the construction of roads.

Rubbered Asphalt a Real Combination

Rubbered asphalt is not a simple mixture of rubber and asphalt but it is a real combination which possesses very desirable new virtues. More particularly, it agglomerates in a cold state under simple compression. This is an excellent quality, which eliminates all the complications of the compression in a hot state. It preserves the special qualities of the rubber: elasticity, imperviousness and adhesiveness. It produces coverings that remain indefinitely compressible; its cohesion is greater, more homogeneous and its point of fusion much higher.

Applied on public roads under the most varied conditions, rubbered asphalt has given proof of superior qualities. Pavement laid more than 20 years ago does not show any trace of wear, has not been subject to any repair and promises still a long career. This is more particularly shown in the covering of La Place de la Gare in Cannes (Station in Cannes, France), laid down in 1904 and exposed to very heavy traffic.

In order to combine rubber with asphalt the rubber is first dissolved in a volatile solvent, which also dissolves the bitumen. Then the powdered asphalt is put into a special mixer and the imbibing of the powder with the dissolution of rubber takes place while mixing. This operation only requires a few minutes. The result is a powder of a darker color than the natural asphalt. In order to harden this powder as a road surface it is only necessary to compress it, yet it will always remain compressible.

Rubbered asphalt has the quality to cement itself and form body with everything it comes in contact with. Moreover, it preserves its complete stability, not being influenced by rising of the surrounding temperature, nor does it harden noticeably in very cold weather.

Some Applications of Rubbered Asphalt

The principal application of rubbered asphalt is the construction of streets in towns. It is a covering on a concrete base; it is simply and rapidly laid. Applied cold, the mixing requires only a few minutes, followed by spreading out and compression; then it is immediately opened to traffic.

This system has given proof of long wear under severe traffic conditions. No irregularities or puddles will form, and the wear is uniform. The cost of upkeep is reduced to a minimum, for repairs are infrequent and when necessary they are very rapidly executed. Due to its elasticity, noise is greatly reduced and the pavement is not slippery. In brief, rubbered asphalt possesses all the qualities of an ideal covering.

It is also used as paving stones, bricks and squares, compressed in a cold state for various purposes. It preserves all the above mentioned qualities under these forms.

Part of the new wharf of the artificial port of Monaco, France, built of reinforced concrete in bridge form and submitted to constant vibrations, was covered with this pavement in 1913 and up to date it shows little wear.

Rubbered Concrete a Combination of Coal Tar and Ordinary Cement

Rubbered concrete is a definite combination resulting from the reaction at a determinate temperature of coal tar on the ordinary cement producing a composition able to be combined with a certain proportion of rubber.

The qualities of this product, elasticity, insonority, etc., vary with the percentage of rubber incorporated, which may be from two to five per cent. Its compressibility is also proportional to the pressure it has undergone for its agglomeration, a pressure which must not exceed a certain amount in order to prevent the product from getting too hard and rigid.

On city roads it is laid on a concrete base. With apparent joints, the blocks are laid on a layer of mortar on the concrete base, the joints are filled with a cement grout and the adherence will be perfect. This process permits the blocks to be taken out for the opening of trenches, and they can be laid back. The paving with blocks gives a still greater security for the wheels of vehicles and horses' hoofs.

[1] By V. Arnaud, retired chief engineer of the Highway Department, Nice, France. Published in the *Revue de l'Ingenieur*, November, 1924.

[2] French patent No. 484,258, January 16, 1917. United States patent No. 1,395,396.

Mastic-Colloid

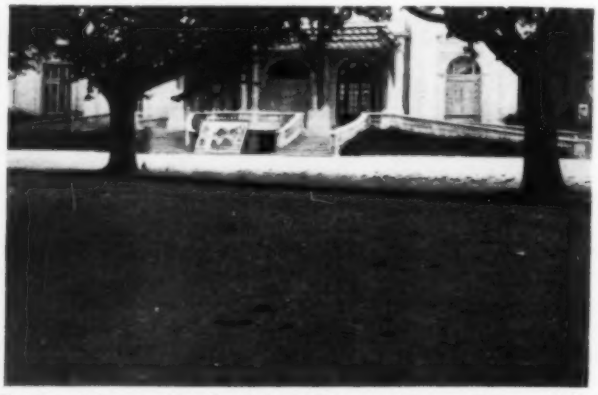
In order to obtain a monolithic covering the blocks are cemented together and at the same time to the concrete base by means of a layer of mastic-colloid. A hermetical joint is thus obtained which will rapidly disappear under traffic and the surface will become a uniform sheet, like asphalt.

The cementing with mastic-colloid must be exclusively used when paving is laid against the rails of street cars, the result being a flexible union which withstands the vibrations of the metal without loosening.

Rubbered concrete gives an excellent covering for urban roads. For highways and public roads it would be advisable to avoid a concrete base for economy's sake. In this case the ordinary blocks are substituted by larger ones of a thickness of 12 to 15 centimeters. These slabs, due to their size and thickness, can be manufactured with crushed stone as used for the construction of macadam roads.

The form of the road is established by crowning and then rolling the surface. It is then levelled by spreading a thin layer of sand, and on this the blocks are directly laid in rows per-

Rubbered Cement Road. Cannes, France—1912



Rubbered Cement Road. Casino Entrance, Cannes, France—1912

Rubbered Pavement. Railway Station, Cannes, France—1904

Rubbered Asphalt Road. La Croisette, Cannes, France—1912

Rubbered Asphalt Paving. Wharf, Monaco, France—1912

Rubbered Asphalt Paving. Wharf, Monaco, France—1912

Illustrations of Rubbered Cement and Asphalt Paving

pendicular to the axis of the road, alternating the joints of the following rows. The long lateral sides of these blocks have a groove on one side and a tongue on the other, which permits them to be fitted together. After the blocks are laid the joints are cemented together by means of mastic-colloid, which is done in a cold state, and the finished road can be immediately opened to traffic.

Colloid Macadam is Treated With Rubber

Colloid macadam, which is treated with rubber, is made of the residue of petroleum. For roads with small grades on rigid underground this material is preferable on account of its simple application and economical advantages.

These residues of petroleum differentiate distinctly from bitumen by their chemical and physical characteristics. They have been applied for building roads, especially in the United States, and have proved inferior to the asphalts of Trinidad. But their use becomes extremely advantageous when mixed with rubber. Then they obtain remarkable qualities, being elastic, waterproof and very adhesive.

The product thus obtained is plastic, compressible and not influenced by surrounding temperature. It binds intimately to itself and is very cohesive; a new layer will adhere to the existing one, which may be more or less worn, without the necessity of dissolving the latter. No trace of the joint will remain, which makes repairing simple as well as perfect.

Colloid macadam is employed like asphalt macadam, it offers the same benefits of reduced labor, and the same simplicity and rapidity of application. This system is really a practical means of solving the problem of economical and durable road pavement.

Advances in Balloon Tire Design—I

Review of Engineering Development to Date—Finality in Balloon Tire Design Not Yet Reached—Early Experiences with First Balloon Tires—Front Wheel Shimmy An Outstanding But Not Exclusively a Tire Problem—Tire Size, Rim Width and Fabric Ply Standards Needed

Within less than two years the balloon tire has run the gauntlet of skepticism on the one hand and of unwarranted credulity on the other, has passed from the realm of uncertainty, and received scientific and popular approval from automotive engineers and car owners. The reasons for this are satisfactory appearance, practicability and transportation comfort. The balloon tire smooths out the big bumps of the road and totally absorbs the small ones. It makes good-riding cars better and hard-riding cars good.

The ready acceptance of the balloon tire is really a remarkable achievement of far-reaching commercial significance because of the opposition which invariably arises against the application of new developments. Production engineers abhor changes and resist them in proportion to the difficulty of accommodation. This is as true of automotive as of tire engineers. Nevertheless, although most of the obstacles in the way of general adoption had to do with the cars on which they were to be used rather than with balloon tires themselves, these obstacles have been largely overcome, and engineering development is progressing rapidly on the remainder of the automotive problems involved.

Finality in Balloon Tire Design Not Yet Reached

The same is true of the steady advances which have been and are being made in balloon tire design, for this revolutionary development did not spring perfect out of the fertile brain of a single tire manufacturer or engineer. It came when it did because numerous minds out of past experience willed that another, the third, important step be taken in tire history. There was a common idea, but the details of working it out by various persons differed. It is therefore no discredit to the tire industry to admit a lack of finality in what has been accomplished in the balloon tire. Time did not allow an attack on the problem in the true research spirit. Also, the commercial element was too strong, and the effect on the automotive engineer as well as on the public had to be considered.

Thus it was that many of the engineering refinements of balloon tire design and application had to be worked out simultaneously with public use of the tire rather than in anticipation of it. It cannot be denied, however, that the rapid spread of the balloon tire idea created a healthy commotion in automobile and tire fields; in the automobile field because it compelled closer study of front-end layout, including wheels, brakes, springs, steering mechanism, vibrations and noises; in the tire field because it featured the demand for closer cooperation among tire manufacturers. That this cooperation was sadly lacking is evidenced by the number of tire sizes first adopted.

Experiences With Early Balloon Tires

The development problems which the tire and automotive engineers faced after the first balloon tires were placed on the market are well indicated by the experiences of the Buick Motor Car Co. with early 32 by 6.20 four and six-ply balloon tires at different inflation pressures. The results of tests on seven cars which covered an aggregate of 1,500,000 miles are summarized by E. A. De Waters as follows:

1. Large-section thin-walled balloon tires increase the resistance to steering, particularly at the curb; they increase the tendency to shimmy at the higher speeds; when inflated to relatively low pressures, they tend to set up a galloping action of the car which is distinctly disagreeable; and when driving in or over deep hard ruts, leaks and blowouts are likely to be caused by the inner tubes being pinched. There is a lack of proper clearance for the external brakes because of the small size of the wheels.
2. Reducing the section of the tire and raising the air pressure 10 per cent, so that the resulting casing represents a compromise between the very large thin-walled balloon type and the conventional high-pressure type, will eliminate the galloping tendency and overcome the excessive wear on the outer edges of the tread of front tires.
3. Four plies are sufficient to insure ample protection against punctures and blowouts when low-pressure tires are used on the front wheels.
4. More than four plies are needed on the rear wheels as a protection against the greater wheel loads and the absorption of driving strains.
5. From the standpoint of durability it is important that tire pressures should be maintained at the recommended figures.

Front Wheel Shimmy an Outstanding Problem

Of all the problems involved, that of front wheel shimmy appears to be the most baffling and that about which opinions and experiences are most diversified and contradictory. A recent meeting of the Society of Automotive Engineers was devoted to the subject, motor car engineers discussing their problems in connection with it. Before the tire division, papers were presented by R. B. Day, B. J. Lemon, E. A. De Waters, W. R. Griswold and J. E. Hale which covered practically the whole field of balloon tire engineering. Under the chairmanship of J. G. Vincent the discussion also contributed many valuable data to those already available on the subject.

B. J. Lemon read an especially informative paper on "Advances in the Design of Balloon Tires," which was at once a record of the progress to date, of the cooperation of tire manufacturers in achieving it, and of the further cooperation necessary to bring about the desirable degree of standardization. An abstract of this paper forms the basis of the present article. To it have been added the salient points of other papers and the gist of the discussion, sometimes in agreement and often contradictory.

Shimmy Not Exclusively a Tire Problem

Shimmy, which may be defined as "magnified synchronization of front-end vibrations," is not exclusively a tire problem, although a tire greatly out of balance may be a contributing factor. That the balloon tire was first blamed for shimmy has been beneficial to the tire industry, asserted B. J. Lemon, for attention was thereby directed to possible refinements and resulted in producing better average balance. It was a natural first impulse to attribute shimmy to the tire, because it was the recipient and focus of the motion. This diagnosis, however, was like treating one's shoulder for the first twinge of rheumatism. It was only local treatment, which generally does not reach and correct underlying constitutional causes. Wheels, rims, axles, brakes, speed, steering mechanism and toe-in, each in turn, have been diagnosed as the producer of the trouble, but the fact that each particular make of car requires a specific and generally different remedy is reasonable evidence that the cause of shimmying motions lies in improper balance.

There is no common panacea for shimmying as revealed in different makes of cars. Each designer must study his own problems and change fundamentally the unbalance to balance whenever and wherever it occurs, and not increase inflation pressure unduly or add otherwise unnecessary devices which are nothing better than temporary expedients.

R. B. Day believes that shimmying is a resonance effect between the tire and the body springs that can be worked out mathematically. He explained that it consists of two kinds: the low-speed variety, which is chiefly a persistent front-wheel wabble without bouncing, and the high-speed type, which is largely a persistent bouncing or galloping accompanied by wabbling. As the solution of the problem seemed to lie in making the car control the tire rather than allowing the tire to control the design of the car, recourse was had to stabilizers for checking the bouncing and to hydraulic dampers for preventing the wabble.

H. A. Huebotter said that vibration will always occur regardless of the individual characteristics of the spring and the tire. The stiffer the spring and the higher the air pressure in the tire, the more rapid will be the vibrations, which may reach a point that is out of the range of the car speed. He had found in one particular problem that, at a car speed of 40 miles per hour and a vibration frequency of 7.5 cycles per second, the force between each wheel and the road is 64 pounds. The turning effort required to steer the car would be the product of this force multiplied by the distance between the steering pivot and the point of contact with the road, and, since the two efforts are built-up, will be double that amount for each wheel.

W. R. Griswold asserted that the springiness of the tires is just as much a fundamental factor in producing shimmying as is the steering layout or the elasticity of the front axle and the steering system. In any mechanism, when periodic changes take place in the magnitude or the direction of the forces that act on elastically connected bodies, so that these forces are timed with any external forces, a state of synchronized vibratory motion is set up, the amplitude of which will grow until equilibrium is established with the damping forces.

In producing shimmying, the elements entering into the motion are (a) the external forces, (b) the rotation of the front wheels, (c) the mass and the mass distribution of the bodies, and (d) the elastic properties. When all the forces are in equilibrium no shimmying will take place.

By means of a flywheel balancing machine, the centrifugal forces in a tire due to unbalance were found to range from 3.1 to 107.6 pounds for a speed of 60 miles per hour. If only one tire is unbalanced, a complete oscillation of stress and deflection of the steering system is produced with each revolution of the wheel. If the revolutions of the wheel correspond to the frequency of the steering system, the deflection will grow until the spindle is wabbling back and forth over a considerable angle. The first wabbling brings in other forces, such as those acting through the center of gravity of the car and tending to list it from one side to the other. This listing can occur only because the elasticity of the tires and the springs will allow it; hence periodic elastic forces are excited and when the condition of synchronism occurs wheel wabble or shimmying results.

If the wheel at the same time is also rotated about the king pin axis, because of the wheel's striking an obstruction, a gyroscopic couple is produced that tends to lift one wheel and to depress the other. The influence of the king pin inclination, wheel camber and toe-in are of relatively small importance.

To overcome shimmying with balloon tires, the most practical method of procedure is:

1. Obtain the best balance in the tires.
2. Reduce the exciting forces due to road shocks to the minimum by proper geometry of the steering layout.
3. Provide sufficient stiffness in the mechanical layout of the steering system.
4. Take advantage of all the damping forces possible without sacrificing riding comfort or ease of steering. This includes utilizing the interleaf friction of the front springs to dissipate vibratory energy.

Tire Size Standardization Needed

Since the advent of the high pressure cord tire, nominal section tire sizes have been very much of a camouflage and a misnomer, stated B. J. Lemon. Cord tires were more flexible than fabric tires and, due to resulting greater deflection, tire sections were made larger without change of size markings. As there were no fixed limits for sectional sizes, it was comparatively easy for a tire manufacturer to increase a tire size for the sake of getting business away from his competitors. So the practice of oversizing sectional rather than nominal sizes became customary. Finally the industry agreed on a 10 per cent oversize for high pressure cord tire sections; but this is not too closely followed.

The same sort of masquerading is going on in the manufacture of balloon tires. Original balloon tire sectional sizes were chosen so as to allow a considerable increase in air volume and corresponding reduction of inflation pressure for loads equal to those carried by the replaced high pressure tire. The early tires actually measured the advertised sectional width. Balloon tire heights also were selected so as to permit interchange with high pressure tires, both for immediate use on cars in service and for original equipment, without appreciably affecting vehicle performance. These sectional sizes and over-all tire heights required for a 20 to 22 per cent sectional deflection a range of inflation pressure from 20 to 40 pounds per square inch to take care of the differences in front- and rear-wheel weights of vehicles falling within rather distinct weight classifications. As there was early disagreement regarding the adoption of one common wheel diameter (the 20-inch diameter) for all sectional sizes of balloon tires, no definite standards of balloon tire heights were adhered to, this resulting in the use at present of eleven tires for original equipment covering 20-, 21- and 22-inch wheel diameters.

With an increase in the demand for balloon tires an agreement was reached to limit sectional tolerance to 2½ per cent oversize, yet at present there are, for example, some 6.00-inch balloon tires which are nearer 6.40, due in some instances to the insistence of car manufacturers. Present signs point to another orgy of oversizing unless all religiously respect the 2½ per cent limit, and that applies equally to motor vehicle and tire engineers.

A study of the sectional sizes of balloon tires used on 20-, 21-

and 22-inch wheels indicates that it appears possible from the standpoint of vehicle construction to confine over-all tire heights to either a 20- or a 21-inch wheel diameter. In other words, both light and heavy cars have been designed successfully to use 20- and 21-inch wheels.

From the tire manufacturer's standpoint the main objection to standardizing at once on an ideal program of 21-inch wheels is the amount of the investment in tire building equipment for tires already used on 20- and 22-inch wheels. A more gradual equipment loss is preferred. This is also the position of many car, wheel and rim manufacturers. However, there is a growing belief throughout the automotive industries that simplification will be a satisfactory solution from both practical and economical standpoints.

The outside diameter of the tire selected for a car of new design, W. R. Griswold pointed out, is governed chiefly by road clearance. Once this diameter has been selected and the design of fenders, axle and speedometer ratios giving a desired performance of the car has been established, it is essential that the rolling circumference should be maintained for all makes of tires denominated by a particular standard size. Increasing tire sections to gain sales advantage has been the cause of many complaints to car manufacturers. When a large tire and a smaller one are run together on the rear axle, steering is not only affected but the control is exceedingly trying.

Rim Width Standards Also Called For

Rim widths for balloon tires vied with tire sizes in the early disagreement, which still persists, B. J. Lemon explained.

The advocates of the narrow rim cite lower weights and costs, better and less localized flexing and therefore greater cushioning, with no unsatisfactory front-end performance, if synchronized vibrations are cared for elsewhere. The wide rim champions cite greater carrying capacity because of greater air volume, greater stability, less side swaying on turns, and perhaps less bead and rim strain, less destruction to tires if run flat, easier steering, perhaps, and a reduction of costs where a tire of smaller sectional size can be adapted.

Wider rims give somewhat greater air capacity, thereby permitting in some cases the use of the tire next smaller in size. However, such substitutions are possible only when different nominal size tires vary so little in actual size that their load-carrying capacities for the same deflection are approximately equal, and one tire should be standardized and the other eliminated.

Using one size of tire on rims of varied size, and vice versa, has created a complicated flap problem, since to function properly the flap should fit the rim seat and the tire beads accurately without wrinkling. This would be overcome by the adoption of a standard rim line-up, using one size of rim for each tire size.

Mr. Lemon believes that a satisfactory rim width is one that measures, between the flanges, from 62 to 65 per cent of the inflated tire cross-section. This does not mean, he said, that tires will not function well on narrower or wider rims, as they are already doing so, but that simplified standards should be adopted.

H. Willshaw called attention to the fact that drop-center rims as a remedy for shimmying have considerable merit in connection with the difficulties concerning wide rims and flaps. The use of 19-inch wheels in England is prompted by economy and is possible because of freedom from ruts and snowdrifts in that country. English manufacturers have adopted as standard the American type straightside tire fitted to drop center rims.

Number of Plies of Cord Fabric

The number of plies of fabric in balloon tires depends on the size, the strength and the spacing of the cords, and the load to be carried, said B. J. Lemon. Tire manufacturing practice discloses differences mainly in the size and the spacing of the cords, but shows practically no difference in the number of plies, due to economic reasons. Regardless of the number of plies, the size and the spacing of the cords, sufficient fabric must be used in all tires to maintain a safe bursting strength factor as determined by road, hydraulic and bursting tests, under conditions comparable with maximum tire load and vehicle speed. On the other hand, because of constant flexing and the heat generated therefrom, and to secure a riding quality demanded in balloon tires, the number of plies and the amount of cotton must be kept at the lowest point consistent with the strength requirement.

About 90 per cent of the car manufacturers use four-ply balloon tires. Six-ply tires will not afford the flexibility and easy riding quality of a four-ply tire of the same sectional size because of the stiffer carcass, and because higher inflations are advocated and logical. But riding comfort is not determined solely by tires. On high priced cars having spring suspensions carefully coordinated with tire inflations it is possible to adopt stiffer tires run at higher pressures and still obtain comfortable riding. Six-ply balloon tires are made for a small number of such cars.

The whole important problem of standardization, said J. E. Hale, is essentially something for the automobile manufacturer to handle, for the public has not given approval to the full balloon tire and the industry has had sufficient experience to judge wisely between the various sizes, dimensions and types of construction. The tires themselves have been properly perfected, as evidenced by the superior durability and lower tire mile cost that they are rendering in comparison with preceding types. Any standard line-up that does not provide four-ply tires in a full range of sizes for passenger cars is defective and cannot serve as a real standard. The six-ply tire in certain sizes is apparently logical as a transition move toward the final standard, but proof is forthcoming that the four-ply large-section tire offers most in the aggregate of comfort, appearance, traction and durability. Too few sizes would be a mistake. Although such a program might have an appeal from a purely engineering point of view, the original cost to the car manufacturers justifies rather small step-ups in cross-sectional sizes, so that the assemblies can be worked out satisfactorily.

Cost of Producing Plantation Rubber[1]

The question is frequently raised whether, with a price of about 1*s* 6*d*, it would not pay an estate producing rubber, say at 8*d* to 10*d* per pound, to pay the additional export duty and ship an extra 5 or 10 per cent above the exportable quota. This is not the case, however, because the extra duty is payable not on the excess only but on the whole quantity shipped, and so would become a considerable cost item. On the exportable quota of 60 per cent production each estate pays the minimum export duty of 1*d* per pound. On exports not exceeding 65 per cent of standard production the duty jumps to 4*d* per pound, and for each additional 5 per cent advances 1*d*.

The all-in costs of plantation rubber as reported by 221 companies for the past two years are given in the following table:

	1922-3		1923-4	
	Crop (tons)	All-in cost (Pence per lb.)	Crop (tons)	All-in cost (Pence per lb.)
140 Malayan companies	37,622	8.68	33,720	9.68
32 Dutch East Indies companies	11,257	9.22	10,890	9.13
28 Ceylon companies	8,111	7.60	6,509	9.01
20 Company plantations elsewhere	4,116	9.07	5,042	8.46

It will be seen that the average cost on 140 Malayan estates under restriction has increased exactly 1*d* per pound. Ceylon shows an increase of 1.41*d*, while the cost of Dutch East Indies companies, many of which operate under a system of voluntary restriction, is not materially changed.

It must be borne in mind that these all-in costs include nothing for dividends and depreciation. An addition of at least 7*d* per pound to the all-in cost is necessary to provide for 15 per cent divisible between dividends and depreciation.

[1]From report of Symington & Sinclair, London, England.

Problems of the Smaller Tire Manufacturer

The Small Factory a "One Man" Organization—Success Depends on Cost—Calculation of Factory Overhead—Typical Compounds—Tire Assembly—Comparison of Rates—Administrative Problems

By Joseph J. Dawson[1]

SINCE the advent of the multitude of small tire manufacturers,—that is, the class showing a production of approximately 1,000 tires per day or thereabouts,—there has been considerable speculation as to what the future of these manufacturers will be and their ultimate chances of surviving in this era of keen competitive marketing. Such questions have been asked as: Have they made money? Can they make a satisfactory profit? Will they eventually be compelled to become a component part of an amalgamation having a centralized control of all executive and manufacturing details?

There is every reason to believe that the answer to the first two questions is in the affirmative, as the reader will no doubt be able to decide for himself. As to the possibility of an ultimate consolidation, we feel that the realization of such an idea is very remote inasmuch as the more astute and weather-wise manufacturer will not readily lend himself to association with those of lesser caliber or those who need the aid of greater minds to revive them from the folly of their own inefficiency. The net advantage to such a manufacturer is practically nil in comparison to that which he is compelled to give.

THE ambition to become a power overnight should be banished from the mind of the small producer. "Mushrooming" is a condition that cannot again occur in the manufacture of tires. The large companies were not created in a day. Growth is the result of long continued effort, hard work and wise business administration.

A "One Man" Organization

The survival of the small factory depends upon the ability of its executive heads to establish a close physical contact with the functioning of the entire business. Modelling and fashioning the working of a small business after methods used by larger organizations is folly. The small business is primarily a "One Man" organization and as long as a "One Man" policy is adhered to and that man is a real business man, success will attend the venture. The foregoing statement may seem out of accord with present methods in vogue in this day of specialization but, after all, the success of all business depends upon a proper relation between costs and market value.

As the small output derived from a small factory cannot carry the expense of statistical records available to the larger manufacturers, it is necessary that the controlling head of the small organization be burdened with the establishment of a financial budget and see that it is adhered to in order that the organization may receive one hundred cents value for every dollar's expenditure.

Success a Matter of Cost

The possibility of success, therefore, is a matter of *cost*. It matters little whether the manufacturer is large or small as far as the final cost is concerned, for it has been proven that it is possible for the small producer to merchandise as cheaply as his larger competitor. Where labor conditions are such in one locality as to cause higher rates than those enjoyed where living conditions are more reasonable, the difference is usually offset by the transportation charges necessary to bring the raw material to this locality and consequently bring the finished product to the market.

The difference that the large producer gains in the distribution of factory overheads by broader supervision and specialization is usually offset by the considerably reduced gross factory overhead resulting to the small producer and by the extremely low percentage of bad work as a result of closer physical contact in the small factory. In the matter of administration overhead the small manufacturer is able to offset the greater sales value of shipments enjoyed by the large company by the fact that, if he is keen and careful his administrative charges should not exceed 20 per cent of his factory cost of sales, whereas in the case of the larger company, due to sales promotion and advertising campaigns, which are continually necessary, the administrative figure is approximately 35 per cent of the factory cost of sales. Considering this last mentioned feature seriously and granting that the large producer can make tires for a lower factory cost than the small man, it is necessary for him to produce for one dollar of factory cost the same article which costs the maker enjoying this advantage one dollar and thirteen cents.

In order to make clearer the foregoing statements it is necessary to show the methods used in arriving at the factory cost of a tire. There is a great difference of opinion as to how a cost should be calculated but it must be borne in mind that the success or failure of a business depends upon straightforward, honest costs that are neither distorted nor misleading. There is one method in use by some organizations on which a few remarks must be made for the sake of safety. That is the so-called bulk method where all of the labor and all of the expense are combined and spread over the production on the basis of weight, thus making tires cost in proportion to size, whereas as a matter of fact the large tire costs less proportionately than the small tire for it can be readily seen that it costs no more to handle, cure, inspect, pack and ship one size than it does another. Accordingly any cost system that shows a unit cost will give satisfactory results if carefully supervised.

The Factory Cost

There are a number of steps to be passed through before a tire is transformed from raw material to the finished product. The most efficient method of compensation for services rendered, especially in the tire business, is the piece work method. It adapts itself much more readily to estimating—a vital factor at times of market fluctuation—and assures maximum production if controlled.

Factory overhead is a very important factor in calculating the factory cost but as this item depends upon the controlling head of the organization it is practically impossible to state a standard figure for this expense with any degree of certainty. However, the following monthly figures, representing the expense figures of a factory producing 1,000 tires per day, will serve as a guide.

Direct labor payroll	$22,500
Indirect labor	$2,500
Supervision	2,000
Superintendence	1,400
Rent	2,000
Light, heat, power	1,300
Steam	3,000
Depreciation, machinery and plant	4,000
Repairs and maintenance	2,800
Operating expense	300
Plant expense	800
Total expense	$20,100

The foregoing figures give 90 per cent of direct labor for operating charges. This figure is very high but will serve as an example for showing the various steps in arriving at a true cost. This percentage should not exceed 50 per cent of the direct labor.

When rubber is received in the raw state it is vital to uniform production that the moisture be removed by drying. In some cases it must be washed. These two operations cost approximately 75 cents per 100 pounds. To this figure must be added 90 per cent for overhead, making the cost for washing and drying 1.42 per 100 pounds. Consequently, if 36 cent rubber is being used, the cost of this rubber in compounds is 37.4 cents per pound.

Tread Stock

The next step to be considered in the cost is the method of finding the finished cost of the compound, that is, after it is milled and calendered or run on a tubing machine for treads. For a typical example take the following tread stock and observe the various steps necessary to make it ready for tire building.

Pounds		Per pound	Totals
48	Smoked sheets	$0.36	$17.28
	Labor and overhead, washing and drying rubber	.0142	.68
5	Glue	.21	1.05
27	Zinc, white seal	.12	3.24
6	Carbon black	.06	.36
6	Thermatomic black	.04	.24
3	Mineral rubber	.026	.08
2	Sulphur	.025	.05
1	Palm oil	.11	.11
¾	Diphenyl guanidine	1.20	.90
98¾			$23.99
	Labor, compounding, per batch		.20
	Labor, milling, per batch		.41
	Labor, tread machine, per 100 lbs., 75 cts.		.74
	Overhead, 90% direct labor		1.22
	Cost of tread, per batch		$26.56
	Cost of tread, per pound		.266

The above procedure is used for calculating the cost of all compounds, whether for use as gum stock or friction. This procedure is known as the continuous process method and makes it possible for an accurate cost to be obtained at any stage of the manufacturing process.

Friction Stock

In the case of friction stock a new condition asserts itself in the form of fabric. The ratio of fabric to compound must be determined and the cost of the component parts calculated in order to arrive at the net value per pound of the frictioned fabric. Take for example cord fabric frictioned and skim-coated, using a 100-pound unit as a basis for calculation.

Pounds		Per pound	Total
38	Cord fabric at	$0.54	$20.52
12	Friction at	.327	3.92
50	Skim at	.33	16.50
	Labor frictioning		.99
	Labor skimming		1.76
	Overhead, 90% direct labor		2.48
	Cost of cord fabric frictioned, per 100 lbs.		$46.17
	Cost of cord fabric frictioned, per lb.		.46

Breaker fabric, square woven, chafer, flap, sheetings, and all frictioned fabrics are figured in exactly the same manner as above. Of course the labor and consequently the overhead necessary to friction other fabrics naturally varies as greater or less time is required to accomplish the work, thus varying the piecework rate. In like manner the friction ratios change, as all fabrics are different in the amount of friction taken up by them.

Beads

The next important step in preparing the component data to obtain a true tire cost is to find the cost of the beads. These are made up of frictioned fabric, gum stock, and wire, semi-cured. In the case of clincher tires it is only necessary to obtain the cost of the bead filler ready for use in the tire as the fabric is a part of the carcass construction. Bead stock is a semi-hard compound having just enough stretch to allow the tire to be applied but having no permanent elongation. Take for example a pair of 32 by 4 beads.

Pounds		Per pound	Totals
110	Bead wire at	$0.24	$26.40
70	Bead stock at	.12	8.40
48	14-oz. fabric frictioned at	.42½	20.40
	Labor, making beads		2.00
	Labor, curing beads		3.00
	Labor, buffing and trimming		1.50
	Overhead, 90% direct labor		5.85
	Cost per 100 pair		$67.55
	Cost per pair		.67½

It is necessary to obtain a cost as above for each size of bead used. This does not mean that a cost must be figured for each tire size, for when the beads are interchangeable the one cost will suffice.

The Tire Assembly

A point is now reached where it is possible to assemble the final cost. This will be done in exactly the same sequence that the various materials are applied to the tire in building. Where it is necessary to show other labor items, not already mentioned, these items will be shown immediately after the material they apply against. For comparative purposes the method of figuring a 30 by 3½ clincher and a 32 by 4 straightside will be shown. Attention of the reader is here called to the fact that from the tire building operation on, both sizes of the tire carry the same amount of labor and overhead. This point is brought out to show that were a manufacturer to accept an order for a small size, using the old pound basis of calculation, he would be unable to carry his overhead, and in the case of a larger size tire he would make considerably more profit than he expected. This is assuming both sizes of tires to be machine built and cured by the air bag process, considering 50 heats per bag as a basis of calculation.

30 x 3½ CLINCHER, 4-PLY

				Totals
2 Beads (head stock)	1.19lb.	@	.131	$0.16
4-Ply cord, frictioned and skimmed	6.31	@	.46	2.90
Labor, buffing and cementing beads				.03
Labor, cutting plies				.05
Labor, splicing plies Labor, assembling stock				.10
8½-oz. frictioned	.68	@	.42	.29
14-oz frictioned	.50	@	.42½	.22
Breaker fabric frictioned and skimmed	.50	@	.40	.20
Cushion	.37	@	.32	.11
Sidewall and color line	1.68	@	.23	.39
Tread	4.10	@	.268	1.10
Labor, tire building				.28
Labor, vulcanizing				.27
Labor, inspecting and wrapping				.05
Overhead, 90% direct labor above				.70
Air bag service				.11
Total factory cost				$6.96

32 x 4 S. S. 6-PLY

				Totals
Beads (1 pair 32 x 4)		@	.67½	$0.68
6-ply cord frictioned and skimmed	10.79	@	.46	4.96
Labor cutting plies				.05
Labor splicing plies Labor assembling stock				.13
8¼ oz. frictioned	.30	@	.42	.13
14 oz. frictioned	.46	@	.42½	.20
Breaker fabric frictioned and skimmed	.78	@	.40	.31
Cushion	1.08	@	.32	.35
Sidewall and color line	1.92	@	.23	.44
Tread	5.10	@	.268	1.37
Labor, tire building				.37
Labor, vulcanizing				.27
Labor, inspecting and wrapping				.05
Overhead 90% direct labor				.78
Air bag service				.12
Flap				.16
Total factory cost				$10.37

Rate Comparisons

No doubt some manufacturers will take exception to the rates set for labor and factory overhead in the foregoing costs, advancing the theory that they are either too high or too low for their particular location. The above figures are based to allow a workman to realize the maximum daily wage to which his training and experience entitle him. The following schedule of rates of pay

will allow any manufacturer to ascertain if his costs are in line with those of his competitors.

Approximate daily wage earned at rates used in preceding cost figures may be as follows:

Washing and drying	$6.00	Bead:	
Compound	6.00	Makers	$6.00
Milling	5.50	Curers	7.50
Calendering:		Bias Cutting:	
Calender man	9.00	Machine man	9.00
2nd man	6.50	Helpers	6.50
Helpers	5.00	Assembling:	
Warmer	5.00	Splicers	8.00
Tread:		Stock layers	4.00
Tubing machine man	7.50	Tire builders	9.00
Helper	4.00	Vulcanizing	8.00
Warmer	5.00	Inspecting and wrapping:	
		Inspector	9.00
		Wrappers and buffers	6.00

It may be said here that the above figures are very near, if not, the maximum, so that a manufacturer enjoying a lower wage scale may readily calculate the advantage gained from better conditions.

In the case of overhead figures previously listed, foremen are paid at the rate of $75 per week and inspectors at the rate of $50 per week. The superintendence carries half of the general manager's salary as well as all of the superintendent's. Rent is calculated at the rate of sixty cents per square foot per annum. Depreciation of plant and machinery at 6 per cent per annum. All other figures are actual.

Final Cost

The costs as figured above are what are known as factory costs and do not carry any other charges until the tires are actually sold, for an article cannot be charged with a selling or advertising expense until it enjoys the benefits derived therefrom. The same condition holds true in the case of adjustments. Tires are drawn from stock for use on adjustments and charged to adjustments at factory cost. All money received from adjustments is credited to the adjustment account and the difference represents the profit or loss on adjustment. It can be readily seen why it is necessary to make adjustments on a tire for tire basis rather than to issue credits which can never be properly reconciled with the accounting without showing a profit in an expense account which is contrary to all good business.

Administrative overheads are the direct cause of failures in every business and this is the point where the "One Man" previously mentioned steps in and proves his real business ability. It is easy to watch factory expenses because they are directly attributable to manufacturing conditions which can be controlled but the administrative expenses that hurt are usually the result of whims of individual members of the organization.

The major administrative expenses are: executives' salaries, discount, salesmen's commissions, selling expense, advertising expense, office expense, adjustments, and transportation. The total of these expenses should not exceed 20 per cent of the factory cost of sales.

Keeping Down the Administrative Charges

The executive should show the same interest in the business that he expects others to show. Let him accept a nominal salary and a percentage of the annual net profit.

Make "Discounts" an asset rather than a burden by adjusting price lists to a point where the discount will get the money in rather than act as an incentive to buy. This can be done by carefully calculating the spread of the lists and making the cash discount an unexpected profit rather than expense to be deducted from expected profits. For instance if a tire costs $10 and a 12½ per cent profit is expected, no tire should be sold for less than $11.25 even after the cash discount is deducted. If for example, 5 per cent is given for cash, then the bottom list should be $11.80. In this arrangement the customer gets all that is coming to him if he pays on time, and if he doesn't, he pays his own carrying charges.

Make the Salesman a Producer

Make the salesman a producer by previously deciding how much business he is expected to produce and rating his drawing account by what he is worth if he produces that business. The drawing account should be established by calculating the business he is expected to produce at the commission rate, previously decided upon rather than by dividing the drawing account by the business to be produced to determine the rate of commission. If the salesman is able to produce this predetermined business give him additional compensation at an increased rate on additional business, for it is the additional business that increases the net profit, because of the fact that the overhead is carried by the previously calculated business.

Salesmen's expenses must be closely watched and territories must be covered, for it is usually the case that points not covered by salesmen are the places where sales are made. Human nature is somewhat similar in its likes and dislikes and the places one salesman does not want to visit are probably not visited by his competitors for the same reasons.

Adjustments and Seconds

Adjustments and seconds are things that affect the small manufacturer considerably more than they do the large producer. In the first place a customer is considerably more critical in purchasing a tire from a small company than he would be in buying one of national reputation. What would pass as a first from a big company would be rejected if offered for sale by a manufacturer having less prestige.

Customers have a tendency to try to take advantage of the small producer when returning tires for adjustment, taking an arbitrary attitude and threatening to withdraw their business, especially if they are a fair sized account. This condition should be handled as diplomatically as possible but if diplomacy fails the relative chances of gaining or losing on the transaction should be carefully weighed, bearing in mind that the customer may have reasons for wishing to buy just as strongly as is your desire to sell. The adjustment account of the small manufacturer is bound to lose some money but not enough to make it a burden.

Advertising Expense

The small manufacturer must closely watch his advertising expense. As a matter of fact he has very little need for extensive advertising, for when this feature is considered seriously it is reasonable to presume that there is sufficient field for a production of 1,000 tires per day within a 500-mile radius of the factory. This being the case, the manufacturer will save expense in transportation, salesmen's expenses, and advertising, and will establish himself in a closer touch with his customers than would ever be possible otherwise. As sales increase and he is able to broaden his business, let him still bear in mind that he is only a little fellow yet, and take in a scope of say 1,000 mile radius. As this operation repeats itself this manufacturer will grow out of the small class and in time will gain the position in the tire business to which his early care and strict attention to small details entitle him.

IMPORTS OF AMERICAN-MADE RUBBER BELTING

Mexico has outstripped British South Africa in importations of American-made rubber belting, the former country taking in 1924 goods valued at $247,615, the total figure for the latter being $198,408. In 1922 the estimates were: British South Africa, $261,708; and Mexico, $178,622.

Other countries showing interesting advances are: Canada (1922), $122,672; (1924), $163,199; Australia (1922), $44,285; (1924), $113,400; and Japan (1922), $18,977; (1924), $82,124. Chile, Argentina, Brazil and Cuba were also among the leading customers during the 1924 period, while England's purchases of this class of goods rose from a value of only $32,289 in 1922 to $212,879 for the year 1924, a more than sixfold gain.

The Rubber Footwear Situation for 1925

Gaiters Increase in Popularity—New Prices and Numbers—Automatic Fastener Types—Chain and Department Store Distribution—Manufacturers' Specials—Leather Shoe Trade Propaganda

RAPID changes have been recorded in the rubber footwear situation since the first of the year. When the 1925 price lists and catalogs went out to the trade on January 1, carrying a general price increase from 7 to 10 per cent, it was the expectation that the salesmen would, in the usual way, harvest the orders for next winter's delivery. New York and Philadelphia, big population centers, experienced an unusually large fall of snow which cleaned the shelves on the overshoe numbers despite the early mild weather of February and March.

Demand for Low Priced Gaiters

Since that time, however, there has been a constant succession of "fliers" sent out to the trade with price changes and new numbers. With the new price of $3.25 for women's first quality four-buckle jersey overshoe, and $4.00 for the automatic fastener gaiter such as the "Zipper," an insistent demand was found for a cheaper overshoe which would retail for $2.50 to $3.00. Thomas Marshall's famous diagnosis of the nation's need for a good five cent cigar was transposed by the shoe retailers to a good overshoe for $2.00. This was forecast last year by the wide sale of the Cambridge Rubber Co.'s "Glengairn" at $2.40, a sateen cloth product, and the Converse Rubber Shoe Co.'s "Marvel" at $2.25, made with a part cotton cashmerette.

For 1925 the Cambridge "Glengairn" is priced at $2.25 and the United States Rubber Co., Hood Rubber Co., and others are offering a similar number at this price, also made with black sateen cloth, cotton fleece lining, and a semi-rolled edge sole. At the same price, the Converse "Bonanza" and Servus Rubber Co.'s shoe carry a cotton jersey cloth instead of sateen. This marks the first venture of the Servus company outside the tennis field.

Competition for this class of business has also produced a still cheaper article, priced at $2.00 and $1.90 offered by Cambridge "Oakdale," Converse "Royal," Hood "Spanish," and Firestone-Apsley women's "Lita." These shoes are similar in type to the $2.25 variety, but with lighter weight fabrics and without some of the features of the others, such as a waterproof gum inner lining.

What is the significance of this sudden change to a low-priced gaiter? It is simply a further development of the craze for wearing low shoes the year round. The public has bought overshoes instead of rubbers, and many women wear them in extreme cold weather even if there is no snow on the ground.

Automatic Fastener Type Gaiters

Novelty types of overshoes have given way to the automatic fastener type. The gay colored linings and astrakhan trimmings have largely disappeared. The automatic gaiter has been the exclusive property of The B. F. Goodrich Rubber Co. with the "Zipper" for several years, and this shoe has been very popular with the high class trade. The increase in price of the women's jersey "automatic" from $3.75 to $4.00 has brought the introduction of a cashmerette top at $3.40. The advantages of the shoe are primarily its ease of operation and its novelty. The disadvantages are the lack of fit round the ankle which the old fashioned adjustable buckle afforded, and the danger of leakage at the base of the fastener. La Crosse "Lightnin'," Hood "Taxi," Converse "Jiffy," Columbus "Dash" (Canada), and the United States Rubber Co. shoe are some of the new automatic fastener gaiters. Firestone-Apsley is offering the "Sheba" again, a trim type of snap-fastener gaiter combining daintiness of style with practical utility.

Factory Production Increasing

The 1925 line of gaiters has already sold heavily in advance sales, so that all manufacturers are increasing their production facilities to a point never before attained. This has been offset somewhat by a lessened demand for rubbers. The principal price change here was in raising the women's croquets and storms from 71 to 75 cents per pair while the men's stayed at $1 on the so-called standard price schedule. Premium quality lines such as the Converse "Leather Heel Seat" line, Goodyear "Gold Seal," and Hood's "Bullseye" and "Arrow" brand are slightly higher priced, 76 to 77 cents for the women's and $1.02 and $1.05 for the men's rubbers.

The women's light rubber has always been the "30 by 3½ or Ford size," of the rubber footwear business. For years the largest volume producer in price, it has showed the smallest per cent of profit and the biggest turnover. Today, however, with its volume threatened by the increased popularity of the gaiter, the price increase brings it more in line.

Chain and Department Store Turnover Large

The largest volume on rubbers today is being done through the chain and department stores who have a large turnover and therefore can command price. The United States "Eskimo" line, priced at 94 cents for the men's and 71 cents for the women's, the Hood "Old Colony" line, and Firestone's "Hudson" brand are wide selling numbers in this field. This class of business is not handled by concerns like Mishawaka with "Ball Band," Goodrich or Converse, these companies making a special bid for first quality business.

The field which the chain store and the department store cannot handle properly is the specialty rubber adapted for farmers, workmen, railroad men, etc., and other industrial workers. These men are interested primarily in quality and service and always buy the best. They purchase rubber footwear at the corner store and specialty shops near the roundhouses and terminals which cater to their trade. For a work rubber they want a product like Converse "Caboose," Goodrich "Norka," Firestone "Deliverer," Hood "Post-Shu," and United States "Patrol."

The Hood Rubber Co. has introduced a new line of light rubbers known as "Lastics," also produced in Canada by the Gutta Percha & Rubber Co. These rubbers are so constructed that they will fit a great number of lasts, thus reducing the amount of stock necessary to carry, making the line ideal for the small merchant with not much capital. Among the features of the line are a heavy rolled edge sole which resists side-scuffing and at the same time is flexible enough to allow for fit over wide and narrow shoes.

Manufacturers Concentrate on Specials

In glancing through the offerings of winter footwear for next season one cannot help but notice the tendency of all companies to concentrate on what seem to be their leading numbers. A comparison of the quality of different lines brings out the fact that every company has certain shoes which stand out as pre-eminent over competitors' goods of that type. By specializing in the kinds of footwear in which they excel, volume and more economical operation are built up simultaneously. Novelty styles are more and more in the background for next year, which is a healthy condition.

The snow this winter in the big population centers has not been deep enough or of sufficient duration to cause any spurt in boot

buying. Footwear manufacturers are working all the time to get away from the complete reliance on weather to sell their products. They realize that severe winters only come every three or four years—we have had two since the war—and in order to operate their plants on an even flow of production they must go after industrial business. Thus a steady outlet for boots is found among such fields as mining, oil, creameries, farming, city construction work, firemen, etc. Brisk retail demand in the cities is only felt when the snow is extra deep, with the resultant sales of storm king boots for boys and girls.

Leather Shoe Trade Propaganda

Rubber footwear designers are keeping in close touch with developments in the shoe trade. Leather shoe manufacturers and more especially tanners are constantly endeavoring to discourage the habit of wearing low shoes the year round. Not long ago an article appeared in a leather trade paper showing a picture of a French high lace boot now being worn in Paris, with the prediction that in 1926 it would be the style here. The objection that it would take ten minutes to lace them up was overcome by saying that women will submit to any inconvenience for the sake of style. The tanners look with longing eyes at this shoe comparing the expanse of leather with the meager footage in an oxford. Certainly if the lace boot did come back the present bread and butter of the rubber footwear industry, the four-buckle women's overshoes, would take a back seat, and the dethroned gum shoe would come back to its own. The leather trade is also trying to combat the enormous influx of crêpe and fiber rubber soles by national advertising with the slogan "Nothing takes the place of leather." To which the rubber man adds as he reads, "Except rubber."

The Distribution Problem

Distribution is a big problem for footwear companies today, as it is with all lines. There is no doubt that during a dull year the expense of maintaining branches equipped to give sudden service to the retailer makes heavy inroads into profits and that the mills selling only the jobber are in a more favorable position. But the jobber is having his troubles these days with chain store competition.

At the present time, although the volume is not as large as they would like to see it, footwear manufacturers are much encouraged with the advance business being booked, which is nearly double that of a year ago, and have every reason to look forward with confidence.

CIVIL SERVICE EXAMINATION FOR JUNIOR TECHNOLOGIST

The United States Civil Service Commission has announced that an open competitive examination for the position of junior technologist is being offered, the receipt of applications to close on April 25. The examination is to fill vacancies in the Bureau of Standards, Washington, D. C., at an entrance salary of $1,860 a year. Applicants must select at least one of the following optional subjects: general technology, leather technology, oil technology, paper technology, rubber technology, and textile technology. Full information and application blanks will be supplied by the United States Civil Service Commission, Washington, D. C., or the secretary of the board of United States civil service examiners at the post office or custom house in any city.

JAPAN'S 1924 IMPORTS OF AMERICAN TIRES

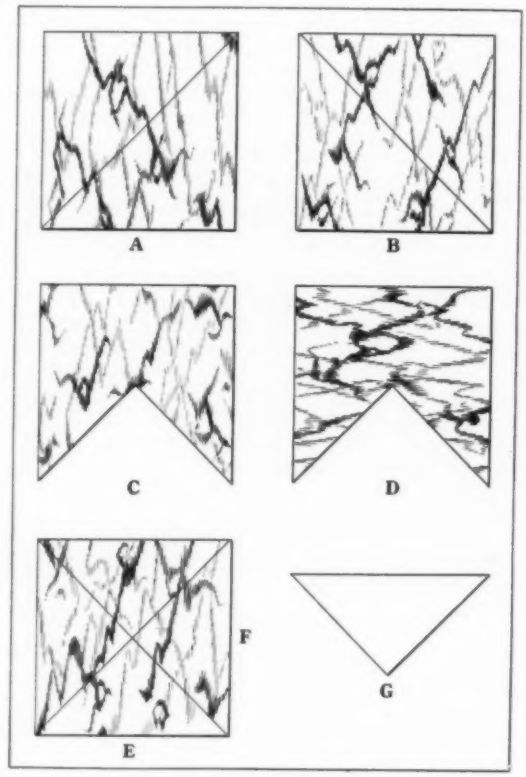
During the past year, and particularly during the first few months of the year, Japanese importations of American casings for automobiles showed a great increase. The total for the twelve months reached a value of $733,538, as compared with only $123,792 for the year 1922. The 1924 figures for January and February alone stood at $130,266 and $117,328, respectively.

Cutting Rubber Tile

By Elmer Swanson

There has been more or less discussion in the rubber floor trade in regard to cutting rubber tile in halves, one-quarter or three-quarters. Each concern has its own style of cutting. One concern may cut left halves, which may be right halves for another, and so on.

If a room is square the space requires just as many right halves as left halves, and four-quarter tile. If the room is oblong or twice as long as it is wide it requires twice as many of one kind of halves as the other, whichever direction the plan indicates the mottling should run.



Types of Cut Rubber Tile

Figure A is a right half. By cutting a tile from the upper right hand corner to the lower left hand corner with the mottling perpendicular, two right halves will result.

Figure B. By cutting the rubber tile from the upper left hand corner to the lower right hand corner two left halves will be obtained.

Figure C is a three-quarter tile cut with the mottling.

Figure D is a three-quarter tile cut from the side of the mottling. An outside corner of a room may be laid with either C or D, depending on the run of the mottling through the field.

Figure E-F is a full tile cut in quarters. The two pieces E run with the mottling, while F is the mottling from the side. The mottling as run in E and F cannot be used as left or right halves on the sides of a room.

Where the floor has no mottling, being plain colors, the cutting of halves makes no difference. They can be used for either left or right halves, and by cutting a half tile again in half a quarter tile is obtained. A quarter cut tile is shown in the illustration at G.

The Manufacture of Cotton Rubber Lined Fire Hose[1]

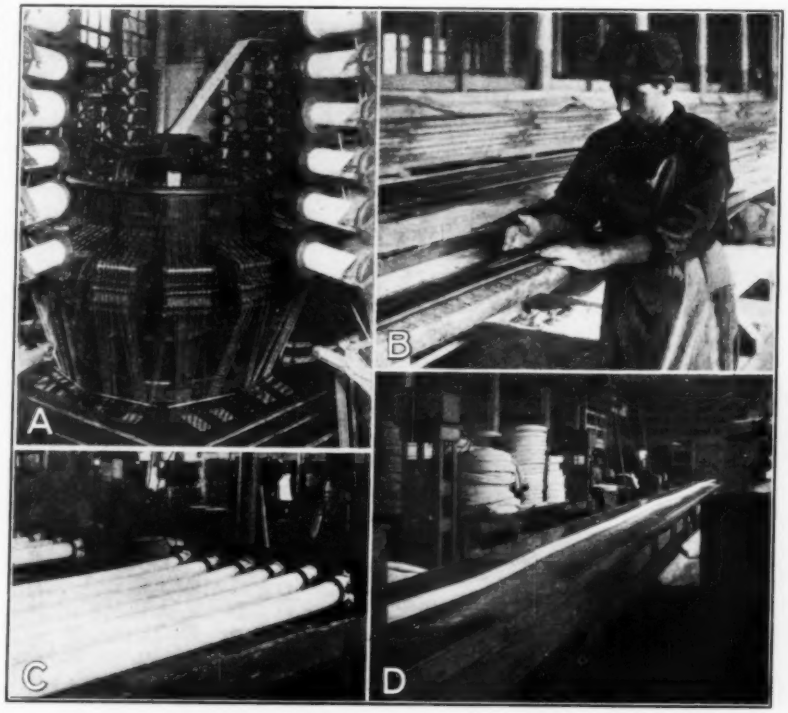
Invention of the Circular Loom and the Method of Rubber Lining—Control of Cotton Fire Hose Quality by Underwriters' Specifications and Tests—Weaving Cotton Hose Fabrics—Making and Curing in Rubber Hose Linings

THE introduction of high pressure apparatus for fire fighting eliminated the riveted leather hose previously used, substituting for it rubber-covered duck ply hose. This in turn has given place to the stronger, flexible and more compact coiling cotton rubber lined hose now standardized for general fire department use.

Early Developments

Efforts to produce circular woven cotton hose began about 1859. It was not, however, until 20 years later that a successful loom for weaving seamless hose was invented by Robert Cowen, backed by Colonel Theodore A. Dodge, and the establishment by them of The Boston Woven Hose & Rubber Co. at Cambridge, Massachusetts, for the manufacture of rubber lined woven hose.[2]

The method for making and lining cotton fire hose with a hand-made calendered tube originated with James Bennett Forsythe, who was for many years President of The Boston Belting Co.



(A) CIRCULAR LOOM FOR WEAVING COTTON JACKETS. (B) MAKING THE RUBBER TUBES. (C) CURING RUBBER LININGS BY INTERNAL PRESSURE. (D) TESTING FINISHED HOSE BY HYDRAULIC PRESSURE.

Principal Operations in Making Fire Hose

Underwriters' Specifications

Cotton rubber lined fire hose from 1½ to 3½ inches is standardized as to sizes, construction, quality and tests by the National Board of Fire Underwriters' specifications[3] prepared by the Underwriters' Laboratories, which operates a system of label service certifying compliance of the hose with specification requirements under their own inspectors of manufacture and tests.[4]

Weaving Hose Jackets

In the group illustration, A shows a modern circular loom for fire hose fabric weaving. It is surrounded by creels supporting spools of plied yarn. Certain of these yarns are colored and appear in the finished hose as identifying stripes. Yarn from the spools passes through guides and tension devices reaching the loom from beneath the operator's walk as pictured. Weaving takes place in the center of the loom around a weaving pin that controls the inner diameter of the fabric. Here the filler yarns are woven around the hose throughout its entire length and the warps interweave with and cover the fillers.

In the picture the flat tubular hose can be seen rising from the center of the loom and passing off to the right above a creel where it is flattened by a pair of rolls and coiled.

Single or multiple ply hose can be made in a loom of this type although the common practice is to weave two sizes of single fabrics, the smaller of which can be drawn within the larger, forming a double jacket hose for great strength.

Rubber Lining

Regarding construction of the rubber lining of cotton fire hose the Underwriters' Specification states: "It must consist of not less than three calendered sheets in one solid body and must be lap-jointed with the lap as small and neat as is consistent with good results." Thus careful calender work is required to eliminate all blisters, pin-holes or other imperfections.

Building the tube sheet at the calender is done upon a smooth rubberized apron to the surface of which the rubber sheet does not adhere too firmly under the pressure of the repeated calenderings.

In order to avoid the need of hand cementing the finished tubes, a thin ply of cement stock is calendered on the sheet. The stock thus comes to the tube cutting department in lengths of somewhat over 100 feet suitable for several hundred feet of hose.

Cutting and Making Hose Tubes

When extended on the cutting table and its calender apron removed the rubber sheet is marked by chalk line into tube widths by the cutter and his helper. The cutter uses a hand knife and bevel cuts the strips with remarkable exactness, following the guide lines free hand as he steps briskly backward along the cutting table. The cut strips are rolled in narrow liners for delivery to the tube maker.

The specification provision of a lap joint necessitates making the

[1] Data and illustrations supplied by the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

[2] "The Evolution of Fire Hose and Circular Hose Weaving," THE INDIA RUBBER WORLD, 1890, 208-9, 234-5.

[3] "National Standard Specifications for the Construction and Test of Cotton Jacketed Rubber-Lined Fire Hose." Underwriters' Laboratories, 207 East Ohio Street, Chicago, Illinois.

[4] "A Brief History of Fire Hose Specifications in the United States." THE INDIA RUBBER WORLD, 1913, 354-6.

tube by hand. This operation is indicated in picture B. The tube maker extends a roll of strips on the back of his bench and lays one of them even with the front edge. In this position he applies powdered soapstone over a part of its surface. This he does by drawing soapstone for the full tube length, controlling its distribution under his hands as he draws it along. He next wipes away with naphtha any dust from the overlapping seam space and proceeds to form the tube in the manner pictured. He carefully folds over and matches the beveled edges of the strip upon a thin and narrow smooth board, finishing the seam by carefully rolling the lap along both edges to insure a tight seam.

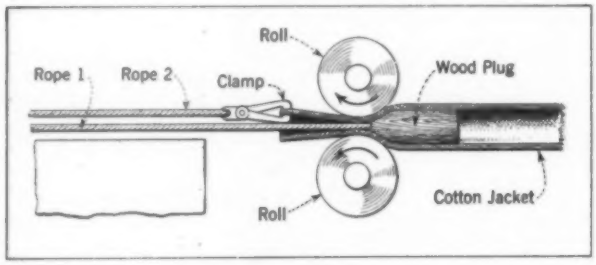
Semi-Curing the Tube

The raw stock tube is given the strength required for drawing it into the fabric by preliminary partial vulcanization. This curing is done by exposing the tubes at full length in an open steam vulcanizer for a brief partial cure.

Lining the Fabric

The flat fabric, before lining, is split back on its edges about 6 inches at each end. The semi-cured tubes are drawn in on a 50-foot bench equipped with a hand or power roller for winding up the ropes, two of which are needed, one for the fabric and the other for the lining.

The arrangement shown in the accompanying illustration is at the opposite end of the bench from the wind-up. It comprises a



Device for Drawing Linings in Cotton Hose Jackets

pair of concave loose steel rollers for guiding the fabric and holding the end of rope 1 by means of a tapered and detachable wooden plug which will not pass between the rolls while allowing the fabric to pass through.

The plug on the end of rope 1 is placed in the end of the fabric beyond the split and attached to the rope that is between the rollers. The rope is made fast at the opposite end. The fabric is then passed, by hand, between the rollers and seized by a clamp attached on the end of rope 2. Power at the wind-up is applied to rope 2 and draws the fabric along the table over rope 1 lying within it. The last end of the fabric is then made fast by clamping over the end of the bench. The plug is removed from rope 2 and in its place the end of the rubber lining is attached to the rope. Pulling this in turn draws the lining into the fabric. In case of a double jacket hose the inner fabric is treated as described for a rubber lining and two drawings are required, one for the inner fabric and one for the lining.

The method described for drawing linings into cotton hose jackets requires only about half the length of room needed to push the rope through the fabric by the hand pole method.

Curing in the Lining

The rubber lining is securely attached inside the cotton fabric by inflating it with steam, the pressure thus embedding the rubber into the fabric structure and vulcanizing it firmly in place.

Illustration C shows the ends of two curing benches with hose attached and under curing pressure. The method of connecting the hose is to draw the split ends to a steam-tight joint on the cone outlet of the steam header. This is done by spanning the hose with a forked clamp having hooked ends which engage projecting lugs on a close fitting iron ring encircling the hose. The clamp is drawn up until the rubber lining under the ring makes the joint against the cone. A half dozen lengths of hose are thus connected for curing at one heat. The steaming-in cure varies somewhat according to circumstances, averaging 15 minutes at 50 pounds per square inch, temperature 297.5 degrees F.

Coupling and Testing Fire Hose

Immediately following steaming-in of the lining the hose is dismounted, trimmed square on the ends and removed for coupling and testing. The prescribed hydraulic tests are made on finished coupled hose. Couplings are always the expansion ring style, which are applied without injury to tube or fabric by means of a special hydraulic coupling machine. Two of these machines may be discerned in D, which shows a hose coupling and testing department.

Bursting test pressures prescribed are 300 and 400 pounds per square inch, according to the diameter of the hose, and are applied by a high duty water pump.

Single and Double Jacketed Hose

By the Underwriters' specifications single jacketed hose is used at fire hydrants, standpipes and similar places. It will not withstand frequent service and is not suitable where the fabric will be subjected in service to chafing on rough or sharp surfaces.

Double and triple jacketed hose is for use on pumping engines and in places where service conditions require the additional protection against wear afforded by the extra cotton jackets.

JANUARY RUBBER GOODS EXPORTS HEAVY

According to statistics prepared by the Department of Commerce, American exports of rubber goods during January of the present year amounting to $3,723,733 were the heaviest of any January since 1920, the figure being more than $1,000,000 greater than that of January a year ago. Exports in January, 1922, amounted to only $2,231,257; in January, 1923, to $2,932,900; and in January, 1924, to $2,709,319. The value of the exports in December 1924, was $3,352,540.

These increased valuations for January, 1925, are mainly due to the fact of an improvement in the tire export trade, such exports being much larger than in January of a year ago. Tire exports in January, 1925, included 112,017 automobile casings, 93,083 inner tubes and 8,326 solid tires, as compared with 97,994 casings, 71,724 inner tubes and 6,409 solid tires in December.

The rubber footwear trade also continues excellent with Great Britain proving to be one of the most important customers. There were 137,954 pairs of rubber boots exported in January, and 89,854 pairs of rubber shoes. A good demand for canvas rubber-soled shoes continues, with the Far East beginning to be a good market. Exports in January of rubber heels and soles totaling 279,659 pounds were greater than for any previous month except October, 1924, when 293,338 pounds were exported.

Improvement was noted in shipments of mechanical rubber goods, while there were also increasing exports of rubber toys, balls and balloons, rubber bathing caps, and druggists' rubber sundries. In general January exports as compared with December represented an increase in practically every class of rubber products.

AMERICAN EXPORTS IN 1924 OF SOLES AND HEELS

Throughout the past year the exports of American-made soles and heels continued in even volume, the value for the first six months reaching $400,301, and the figure for the last half of the year $422,711, or a total of $823,012. It is interesting to note that the estimate for the year 1922 was $699,135, while the figure for 1921 was only $512,320.

What the Rubber Chemists Are Doing

Plasticity Control in Rubber Mixing[1]

By Paul Beebe and R. B. Stringfield[2]

THE present paper does not pretend to describe any new properties, but illustrates some of the ways in which plasticity measurements can be employed to prevent trouble in the rubber factory.

Although to determine the characteristics of any unknown stock it is necessary to determine several points on the plasticity curve and even at different temperatures, with any stock whose general characteristics are known it is sufficient for most factory purposes to determine one suitably selected point at a definite temperature. Accordingly, for control purposes on most stocks we take as a plasticity measurement for comparative purposes the gage in centimeters shown by a 2-cc. sample of the stock after being subjected for 3 minutes to a load of 5 kg. between parallel flat surfaces at 70 degrees C. For this purpose a plasticity press is used, this being mounted in a constant temperature oven held at 70 degrees C. The operator keeps five samples warming up in the oven at all times, and one in the press, placing a cold sample in the oven as each warmed sample is placed in the press and cutting out a fresh sample during the 3-minute intervals between readings.

A recently introduced improvement is a small arbor press carrying two hemispherical dies for cutting out samples. These dies are vented with a 1-mm. hole in the center of each depression to permit escape of air while cutting, and yield a 2-cc. sphere of stock within an accuracy of about 2 per cent. It is now possible for the operator to use two plasticity presses simultaneously and thereby turn out over two hundred samples per day.

The plasticity of a rubber stock is largely determined at the mixing mill. Although until recently the industry has had no numerical method of evaluating this property, it has long recognized that smooth operation of calenders, tube machines, etc., depends on having stock of uniform consistency, and most of the large companies, at least, mill their stocks to definite specifications, giving weight of batch, time, order of mixing, etc.

The plasticity of any given mill batch can be altered or controlled by changing one or more of the following factors: 1. temperature, (a) by mill water control, (b) by adding water on the batch, (c) by controlling gage of stock; 2. time of milling; 3. size of batch; 4. type of rubber; 5. type of softeners, amount, and point of addition.

Our methods now afford compounders a laboratory test which gives them a definite numerical answer showing whether a milling change has toughened a stock, whether one stock is tougher than another, and whether any given stock is coming of uniform consistency.

Mill Water Control

As the temperature of the mill is vitally affected by the temperature of the cooling water, it is to be expected that the plasticity of the stock will be affected. Different batches of pure gum stock mixed in succession by the same mill man check very closely as to plasticity, the batch requiring attention practically the whole time, and consequently each batch receives almost identical working. At the calenders it is found that above a plasticity of 0.370 scorching trouble begins to appear. Consequently, we now aim to alter the milling specifications whenever necessary and to keep the plasticity of this stock as close to the optimum figure of 0.360 as possible. The fact should not be overlooked that it is possible to scorch a stock by running at too thick a gage or by piling up slabs without sufficient cooling, and to vary the plasticity by varying the warming-up conditions.

Effect of "Working" Stock

In most cases the uniformity of the stock is found to be more important than the absolute plasticity, which usually means that the tougher a stock is run, as long as it is kept safely inside the scorching limit, the less is spent for milling. Figures, taken on a batch mixed at 0.5-inch gage and carrying a large bank, show how rapidly the temperature of the stock on the face of the roll rises when it is allowed to run without being cut into. In this case all the power goes into heating a small portion of the batch and, the gage being fairly thick and the rubber a poor conductor of heat, more heat is generated than can be carried away and the temperature rises rapidly. As a result this portion of the batch is heat-softened and receives less permanent softening by mechanical working than it should; moreover, it is very likely to scorch if any curing agents are present. In fact, some sensitive stocks, which would withstand a temperature of 200 degrees F. for a long period without any indication of scorch, will scorch badly at an average temperature on the mill of 200 degrees F. or less.

Effect of Adding Water on the Batch

One gallon of water evaporated on a 225-pound batch of rubber will carry away heat equivalent to cooling the entire batch 90 degrees F. As the highest rate of power input is while the rubber is first breaking down and the heat so generated tends to soften the rubber and lessen the permanent mechanical softening, the optimum time to add water is as soon as the rubber is smooth around the roll so that the water will be held on the roll, not fall into the mill pan. As the heat is actually generated at the bite of the rolls, nothing is gained by using a spray, and the water may more conveniently be poured on slowly, with care not to over-cool the stock so that it breaks from the roll. Although many rubber men have at times added water at the end of a batch to stop incipient scorching, the writers believe that the use of water as an aid in plasticizing is new, and whereas its use requires some discretion, large-scale operations have demonstrated that batches can be handled by this method under summer conditions that would otherwise be impossible.

Type of Rubber

The most uniform rubber on the market from the plasticity standpoint is pale crêpe, with smoked sheets a fair second, and brown crêpes a poor third. The possibilities of grading raw rubbers by their plasticity figures are interesting. A tough lot of rubber will cause hotter and tougher batches and may cause scorched stock. Breaking down or massing the rubber on separate mills puts the peak of the power consumption where there is no scorching danger and leaves a somewhat more uniform rubber for further milling.

Oil Softeners

The use of the various types of oil softeners and greases which has become common in recent years, introduces another means of varying the plasticity. The later these are added to the batch the softer the stock, the difference between adding the softener to the rubber at the first of the batch instead of with the compound at the end of the batch being often as much as fifty points on the plasticity. Differences of twenty points or more are also found between stocks using the same amounts of different softeners.

[1] Presented before the Division of Rubber Chemistry at the 68th Meeting of the American Chemical Society, Ithaca, N. Y., September 8 to 13, 1924.
[2] Goodyear Tire & Rubber Co., Akron, Ohio.

Modern Materials Used in Rubber Compounding[1]

By A. A. Somerville[2]

The modern materials discussed by Dr. Somerville were specially processed clay, carbon black, thermatomic carbon, mineral rubber, organic colors, and certain organic accelerators.

Specially prepared clay is the cheapest of all the modern light gravity compounding materials. Some clays are stiffeners, others only diluents. A reasonable amount of high grade stiffening clay is used to good advantage in tire treads and beads, footwear, heels, hose and various molded goods.

Carbon black is one of the best and most important materials available to the rubber compounder, and is relatively cheap. A properly cured stock containing a fair amount of carbon black shows more stiffness than any other stock known. Thermatomic carbon is a new form of carbon. It acts differently from carbon black in rubber. It does not retard, cure, nor stiffen so much as carbon black. Instead it mills into rubber relatively easily and makes a soft batch.

Mineral rubber serves well the purpose of making crude rubber more easily handled on the mill, calender, tubes, etc. It also helps to prevent oxidation, easily blends and acts as a good vehicle.

A great many organic colors have been perfected which work well with organic accelerators and outclass the old mineral colors.

Two organic accelerator families are of special interest, tetramethyl-thiuram-disulphide and the metallic salts of dithio-carbamic acid. The first of these is not only an accelerator, but it is also a vulcanizing agent. When used to the amount of 3 per cent on the rubber with a little zinc oxide as an activator it will cure in 5 minutes at 20 pounds of steam or in 10 minutes at 60 pounds in a mold, and either cure will show a tensile of about 4,000 pounds per square inch.

Metallic Salts of Dithio-Carbamic Acid

Forty of these salts have been prepared and apparently only three among them are not accelerators. All the others are not only fairly strong accelerators, but also strong organic colors, and some of the cheaper ones produce exceedingly high tensiles in a short cure.

Several materials are now known which when used in very small quantities in a rubber compound will cause goods made from such a compound to resist the action of oxygen splendidly. These materials are known as anti-oxidants, and the laboratory testing of the effects of oxygen on rubber goods is now rapidly coming into vogue.

[1] Lecture before the Institution of the Rubber Industry, London, March 2, 1925.
[2] Vice-president R. T. Vanderbilt Co., New York, N. Y.

A Comparative Study of Some Vulcanization Accelerators[1]

By D. F. Twiss and F. Thomas[2]

The authors summarize the results of their study as follows:

The phenomenon of "flat-cure" or "plateau effect" in vulcanization with the aid of certain organic accelerators is best examined with a relatively high proportion of sulphur in the mixture.

The "plateau effect" may be induced by the accelerator through an abnormally rapid development of tensile strength in the rubber at an early stage of vulcanization as judged by other standard criteria. It may also be caused by a "depolymerizing" effect of the accelerator on the rubber whereby the physical signs of over vulcanization are delayed. This method, however, involves a product with an abnormally high coefficient of vulcanization and must be regarded as undesirable.

On the other hand, the "plateau effect" may arise from the rapid disappearance of the accelerator which thereby aids the attainment of good physical condition without danger of over vulcanization.

If the accelerator disappears too rapidly its actual effect in the earlier stages of vulcanization may be impaired. This is the case with the xanthates at higher temperatures and with zinc methyl-xanthate (relative to its homologs) even at low temperatures.

[1] *Journal of the Society of Chemical Industry*, March 6, 1925, 100T-106T.
[2] Dunlop Rubber Co., London, England.

Technology of Paint and Rubber[1]

Viewing some of the fundamental physical differences between a solid and a liquid, a liquid will move, no matter how slight the pressure, while a solid requires the application of a definite initial force, after which both behave in the same way; where liquids have viscosity, only solids have what might be called a "yield value."

While it is a valuable hypothesis to assume that paint and rubber structures consist of solid and liquid phases, it has so far been beyond direct proof, because of the difficulty of staining one phase and observing the phenomenon. The presence and effect of moisture and humidity in paint films can be demonstrated. All paint and varnish films take up moisture (possibly 5 per cent) in case of saturation. This permits stretching.

Viewed in general, all metallography is one form of plastography; but in this field it is not possible to produce pictures. When a paint film is dried it cracks. The liquid phase is not present to permit stretching. Considering the same line of thought in rubber, you have a different stretch shown between vulcanized and unvulcanized rubber. In the first case you have a "slush," consisting of a coagulated rubber and a liquid phase between the particles. Rubber is difficult to dry, and the presence of lead and zinc soaps aids this because they take up the moisture in the liquid phase.

In a paint film, if the surface protects the interior from ultra-violet light those reactions designed to solidify the film are slowed down.

In the action of sulphur on rubber, the view of the speaker was that the sulphur must migrate and take up a position around the rubber particles. Accelerators promote this migration. Here the sulphur takes the place of the water film in a paint or an oil film, and the rubber is stiffened up. When in this condition, the stretching properties are different from those of the crude rubber.

That the action was of this nature rather than a strictly chemical effect was indicated to the speaker by the fact that, beyond a certain limit of sulphur in a given case, the effect was the same. Four times the minimum of sulphur required did not increase vulcanized properties. Where the sulphur is added in great amounts, as in the production of hard rubber, a product is secured that has many of the properties of pure sulphur.

[1] Address delivered February 3, 1925, by F. G. Breyer, of the New Jersey Zinc Co., Palmerton, Pennsylvania, before the Society of Chemical Industry, the Canadian Institute of Chemistry, and the Toronto Paint and Varnish Superintendents' Club, reported in *Canadian Chemistry and Metallurgy*, March, 1925, 70.

Determination of Sulphur in Mixtures of Raw or Vulcanized Rubber[1]

Accurate results can be rapidly obtained by the following method: In a roomy silver crucible projecting not more than 0.5 cm. through a hole in an asbestos board, about 20 g. of pure potassium hydroxide are fused and allowed to cool to a pasty consistency, 0.2—0.5 g. of the finely ground or rolled rubber being then quickly mixed in with a silver spatula. The mass is heated gently until almost the whole of the organic matter is destroyed, about 5 g. of potassium nitrate being then added. The sulphate thus formed is determined in the usual way as barium sulphate.

[1] V. C. Butironi, *Giornale de Chimica Industriale ed Applicata*, 1924, 6, 535-536.

any iron present being previously removed by precipitation as hydroxide.

Some Vulcanization Accelerators

D. F. Twiss and F. Thomas[1]

Experiments with many accelerators indicate two types of action: (1) the accelerator exerts its effect to the end of the usual range of vulcanization experiments; (2) others are active in the early stages of vulcanization, after which, on account of the formation of inactive products, practically only unaccelerated vulcanization takes place. The terms "persistent" and "fugitive" are applied to these two types of accelerative effect.

Among inorganic accelerators the "persistent" type is represented by magnesium oxide, calcium and potassium hydroxides, potassium hydrosulphide, and sulzin. Of the "fugitive" type are litharge and mercuric oxide.

Organic accelerators are found similarly to exhibit these two types of action. Many organic accelerators must be used in conjunction with zinc oxide or a suitable zinc salt to produce the maximum accelerative effect; and for purposes of classification, not only should the presence or absence of zinc oxide apart from the mixture be considered but also its proportion when present. Of the organic accelerators examined most of them exerted a persistent action and a few fugitive action.

Organic accelerators of fugitive action in the presence of zinc oxide include the dithiocarbamates and thiuram disulphides.

[1] Research Laboratory, Dunlop Rubber Co., London, England.

Chemical Patents

The United States

Process for Obtaining Rubber-Containing Materials. An initial coating of latex combined with sulphur is formed on a moving metal belt, a web of filamentary material is fed to the surface of the latex, the web is sprayed with latex containing sulphur, dried, stripped from the sheet and vulcanized.—Ernest Hopkinson, New York, N. Y. United States patent No. 1,526,984.

Metal and Means for Metalizing Surfaces of Rubber Compounds Containing Sulphur. A metal sulphide is produced on the surface by combination of a metal with the sulphur in the rubber, and this sulphide is subsequently reduced.—Albert I. G. Warren, Caterham Valley, Surrey, assignor to Caterham Works Limited, London. United States patent No. 1,527,241.

Antimony Sulphuret and Process of Making It.—Fred K. Bezzenberger, East Cleveland, assignor to Ray S. Gehr, trustee, Cleveland. United States patents Nos. 1,528,394; 1,528,395 and 1,528,396.

Method of Making Synthetic Chicle. Pontianak gum is purified by thoroughly agitating it in the presence of caustic alkali solution at a relatively high temperature but below the boiling point and then cleansing the gum by aqueous applications.—Ludwig W. Buckley, West Somerville, Massachusetts. United States patent No. 1,528,526.

Manufacture of Rubber Threads. A rubber solution is subjected to the action of cooled sulphuretted hydrogen. The treated solution is formed into thread-like filaments and then subjected to the action of sulphur dioxide.—Max Draemann, Cologne, Germany. United States patent No. 1,528,538.

Process of Making Rubberized Fiber Composition. A quantity of fibers are mixed in a rubber solution and a quantity of rubber solvent and precipitant is added. The fibers are strained from the liquid, formed into a mat, washed and vulcanized.—William G. O'Brien, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,529,207.

Match Composition. A match head composition including rubber latex.—Hugo H. B. Schapiro, assignor to The Ohio Match Co., both of Wadsworth, Ohio. United States patent No. 1,529,322.

The Dominion of Canada

Accelerator. An aryl di-substituted guanidine having an akyl group in the ortho position.—Dovan Chemical Corporation, assignee of Morris L. Weiss, both of New York City. Canadian patent No. 247,133.

Process of Vulcanization. Producing vulcanized rubber by heating a mixture of rubber and sulphur with the polyaldehyde derivative of an aldehyde-amine reaction product.—C. Olin North, Tallmadge, Ohio. Canadian patent No. 247,485.

The United Kingdom

Concentrating Rubber Latex. Latex is concentrated or solid rubber separated from it by treatment with a vegetable or animal colloid substance such as carragreen or Iceland moss or gelatine.—I. Traube, 29 Schlossstrasse, Charlottenburg, Berlin. British patent No. 226,440.

Oil from Vulcanized Rubber. Oil obtained by distillation of vulcanized rubber is deodorized by distilling at atmospheric or reduced pressure in presence of a suitable mineral acid, treating the distillate with a solution of sodium hypochlorite or bisulphite, then with caustic soda and finally washing and filtering the oil through fuller's earth.—A. Bray, 155 Rue du Trone, Brussels. British patent No. 226,475.

Vulcanizing Rubber. Example, a mixing of 100 parts crêpe rubber; 3 parts zinc oxide; 1.5 parts sulphur, and 0.5 parts of the reaction product of diphenyl, or ditolyl guanidine with dimethyl-dithiocarbamic acid is vulcanized in 15 minutes at 228 degrees F.—Dovan Chemical Corporation, 30 Church Street, New York, N. Y., assignees of M. L. Weiss, Newark, New Jersey. British patent No. 226,836.

Germany

Patents Issued With Dates of Issue

409,214 (May 18, 1923). Method of cold-vulcanizing rubber and rubber-like substances. Dr. Max Le Blanc and Dr. Martin Kröger, Linnéstrasse, Leipzig.

Rubber Division Program

At the sixty-ninth meeting of the American Chemical Society to be held in Baltimore, Maryland, April 6 to 10, the following program of papers will be read before the Division of Rubber Chemistry.

"Relation Between Adsorption Power of Clays and Their Behavior in Rubber Compounds."—H. R. Thies.

"The Absorption of Water by Rubber."—J. T. Blake.

"The Effect of Humidity in Rubber Testing."—R. B. Stringfield.

"Comparative Tests on Sodium Fluo Silicate—Coagulated Rubber."—C. R. Park.

"Studies in Physical Properties of Rubber—II."—L. B. Sebrell, C. R. Park, and S. M. Martin, Jr.

"The Effect of Milling on Rubber Stocks."—E. B. Spear and R. L. Moore.

"The Distribution of Carbon Black in Rubber Stocks."—E. B. Spear and R. L. Moore.

"More Complete Evaluation of the Pigment Reinforcement of Rubber."—W. B. Weigand.

"The Ultra-Violet Microscope in the Study of Vulcanized Rubber Latex Globules."—Henry Green.

"The Electro-Deposition of Rubber."—S. E. Sheppard and L. W. Eberlin.

"Effect of Accelerators on Cure and Quality of Various Rubbers."—A. O. Zimmerman and R. P. Dinsmore.

Note on the Rate of Combination of Sulphur with Rubber in Hard Rubber Goods.—W. E. Glancy, D. D. Wright, K. H. Oon.

"Further Developments and Applications of the Oxygen Aging Test."—J. M. Bierer. Symposium.

Determination of Balata in Balata-Rubber Mixtures

By J. T. Charleson[1]

It has been shown in previous publications[2] that balata could be separated from resins and impurities by dissolving the crude product in hot pretroleum ether and precipitating it by cooling the solution to 16 degrees C.

By this treatment the balata comes down as a white precipitate, the resins remain largely in solution and the solid impurities mostly in suspension.

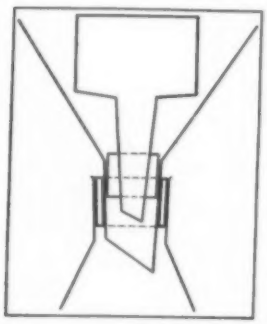
Several other methods are discussed in the literature, but none have been reported which are sufficiently accurate or applicable to quantitative determination, and no mention is made of separating or determining the balata in balata-rubber mixture. Owing to the fact that balata is used in many articles of trade, and especially in construction of golf balls where it is compounded with rubber, analyses are frequently desired.

The following method works satisfactorily in determining quantitatively the balata in balata-rubber mixture.

Method

Mill the sample very thin, or if a mill is not available cut it with a knife in thin strips. Weigh accurately 2.5 to 3.0 gr. and place in a 250 cc. wide mouth bottle or in an Underwriter's flask. Add 150 cc. of light gravity naphtha, distilling under 115 degrees C., cover and place on the steam bath until dissolved, mixing occasionally by shaking. When solution is complete the liquid should be quite clear except for any pigments that may be present.

Cool the solution to room temperature, then place the bottle in an ice-salt-hydrochloric acid mixture and continue cooling to at least 12 degrees C., mixing occasionally by shaking. The balata should be precipitated in a flocculent form, carrying any pigment present quantitatively with it, and leaving any rubber present in solution. Prepare a 4-inch Buchner funnel fitted into a large funnel and packed in an ice-salt mixture, and mounted on a suction flask as shown in the accompanying illustration. Filter by suction, using a tared No. 40 Whatman filter paper cut to fit the bottom of the funnel. Pour the solution slowly on the paper, keeping part of the paper clear as long as possible. Wash the bottle free from precipitate with solvent naphtha cooled below 0 degrees C. After the precipitate is all on the filter paper, wash it with four 25 cc. portions also cooled below 0 degrees C.



Arrangement of Buchner Funnel

Place the paper with precipitate on a watch glass and set it inside of a large beaker. Place the beaker on top of a steam bath, or hot plate where a temperature of 50-60 degrees C. can be maintained at the bottom of the beaker and allowing a small current of air to flow through the beaker during drying. Then place it in a 65 degree C. oven for 15 minutes, cool in a desiccator, weigh, and repeat drying and weighing to constant weight. Ash the paper and contents and determine the actual balata precipitated by difference.

In order to determine the accuracy of the method the following samples were prepared and milled on a 12-inch mill. The composition and analysis of each are given in table below:

	(Hardened) Balata		Rubber		Zinc Oxide	
Samples	Known	Found	Known	Found	Known	Found
1	100.0	99.5–99.8	...	.....	...	...
2	90.0	89.5–90.0	10.0	9.8–10.2	...	...
3	70.0	69.7–70.5	30.0	30.5–29.8	...	...
4	40.0	40.8–40.2	60.0	59.7–60.6	...	...
5	77.5	76.9–77.6	17.25	17.6– ..	5.25	5.17
6	80.5	80.3–79.6	15.0	14.6– ..	5.0	4.92
7	80.0	80.1– ..	15.0	14.8– ..	5.0	5.15
8	80.0	80.7– ..	15.0	.....	5.0	5.00
9	81.5	80.8– ..	13.5	.....	5.0	5.16
10	84.0	83.4–84.0	11.0	11.1– ..	5.0	4.78

The results of analysis on samples 1 to 9 were obtained by the writer, and on sample 10 by another analyst.

The rubber can be determined either by difference or evaporating the filtrate after balata is separated. The amounts of rubber in experimental samples as given in the table above were obtained by evaporating the filtrate in a tared petri dish, the residue dried in a 65 degree C. oven to constant weight.

Notes: (1) The above method is accurate within approximately 1.0 per cent with ordinary samples. (2) Balata is found to precipitate and handle better when the determination is carried through without delay. If allowed to stand in solution, the balata comes down on cooling in a very finely divided form which is more difficult to filter. (3) The method of drying prescribed prevents melting of the sample and allows the solvent to escape rapidly. Precipitated balata oxidizes very readily and must not be exposed to heat and air any longer than necessary or it will gain weight. The resins formed by oxidizing balata in the air are soluble in acetone but insoluble in cold naphtha, and are precipitated with the balata if present. (4) The resins in balata are determined by extracting a 2 gr. sample with acetone for 12 hours; evaporate the extract in a small tared beaker, dried in a 70 degree C. oven, desiccate and weigh. The extract oxidizes very rapidly and must not be dried longer than necessary. (5) Hardened balata contains ordinarily 0.5 to 2.0 per cent resins. Successive solutions and precipitations will continuously lower the resins content, but the last traces are difficult to remove. Therefore, in the above method of analysis a portion of resinous material in the original hardened balata remains in the solution and is calculated as rubber. There is therefore probably some tendency for the rubber to run higher than it should.

[1]The Goodyear Tire & Rubber Co., Akron, Ohio.

[2]E. F. A. Obach "Cantor Lecture" *Journal Royal Society Arts*, 1897-8, 46, 117, 137 and 169; *Journal Society Chemical Industry*, 17, 470, 1898. C. W. H. Howson, *Rubber Age*, London, 5, 512, 523, December, 1924. *India Rubber Journal*, 68, 999 and 1045.

CRUDE RUBBER COMMITTEE MEETING

The Crude Rubber Committee of the Rubber Division of the American Chemical Society held a meeting March 9, 1925, at the Chemists' Club, New York City. Those present were: C. W. Sanderson, E. A. Van Valkenburgh, R. P. Rose, H. A. Hoffman, E. W. Fuller, Lewis Venuto, D. F. Cranor, and Mr. Clark, representing W. R. Sturtevant.

It was decided to prepare and submit to the Rubber Division at Baltimore a tentative method of recommended procedure for use in testing crude rubber.

The Rubber Association of America having appointed R. P. Dinsmore, H. A. Hoffman, R. P. Rose and E. A. Van Valkenburgh a sub-committee on the packing of crude rubber, the subcommittee of the American Chemical Society on the same topic has been discontinued.

FORMIC ACID AS A COAGULANT

In a recent note on the cost of formic acid as a coagulant it is stated that recent tests show formic acid to be more efficient than previously supposed. It is now found that the ratio, in comparison with acetic acid, is at least 2 to 1. Comparing formic and acetic acids at current prices for 90 per cent acids and an effective ratio of 2 to 1 the cost of coagulating latex on this basis is reduced approximately to one-half by substituting formic acid for acetic acid. So far as can be seen there is no risk of spoiling the rubber by the substitution.—Henry P. Stevens in *The Bulletin of the Rubber Growers' Association*, January, 1925, 51.

New Machines and Appliances

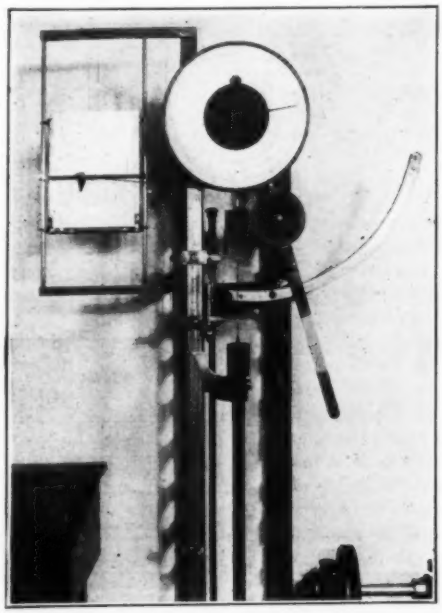
Testing Machine Attachment for Recording Stress-Strain

A PRACTICAL device, attached to the usual standard testing machine, is here illustrated. It consists of a vertically sliding chart holder the movement of which is made to correspond exactly with the increasing interval between the pointers as the sample under test is stretched.

The movement of the chart holder is effected by the pull of a non-stretching cord adjustably fastened to the machine frame below. The cord passes upward and downward over several idler pulleys whereby increase of the interval between the pointers is duplicated in the vertical movement of the chart.

In operation it is only necessary to insert a chart in the holder, adjust the zero point to the pen, both vertically and horizontally, then proceed with the test in the usual manner. The operator, by hand, follows with the pointers the movement of the test marks on the sample as the latter stretches. As the pointers follow the one-inch reference marks on the sample the cord raises the chart an equal amount and at the same time the pen is carried across the face of the chart.

The smoothness of the curve described is dependent on the skill of the operator in following the marks with the pointers. The record shows directly the stress-strain curve of the sample under test. The curves must then be corrected for difference in gage of the sample.



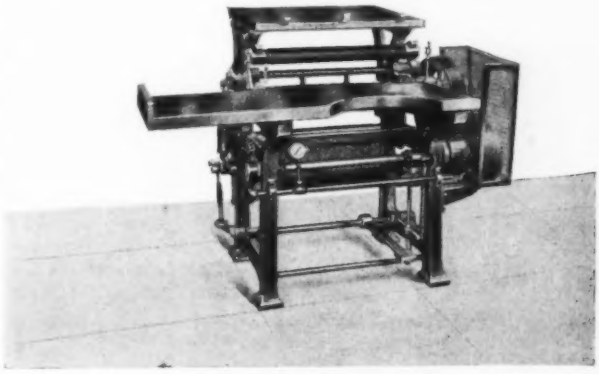
Stress-Strain Recording Device

This device was designed by C. S. Williams, rubber technologist of the Roessler & Hasslacher Chemical Co., 709 Sixth avenue, New York, N. Y.

Airbrake Hose Making Machine

The illustration shows the latest design of machine for putting the rubber cover and labels on airbrake or other short railway hose. It is intended to be used in connection with one making and two wrapping machines. It is a three-roll machine, the lower ones are made of steel and are driven, the top roll is rubber covered and revolves in contact with the hose. The pressure on the top roll is applied by a single acting air cylinder and the roll is raised by counterweight when the air is released.

The machine is designed for an initial air pressure of 80 pounds. All gearing is machine cut, and a friction clutch is provided for driving the lower rolls. The front table is of hard wood, zinc covered, and extends to the left to carry the roll of cover stock from which the operator cuts the covers as needed.



Farrel Airbrake Hose Machine

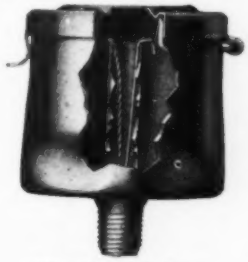
The cover is attached to the partially completed hose placed in the machine. The top roll is brought down by pressing the foot pedal which also sets the lower rolls in motion, and the cover is wound on the hose in the usual manner. The brand or trade marks also can be applied on this machine. When the pedal is released the rolls stop and the top roll rises. The hose can then be removed and passed to the wrapping machine.—Farrel Foundry & Machine Co., Ansonia, Connecticut.

Belt Fastener

Cone pulley belts are a special source of trouble and production loss because of their high tension, speed, exceptional strain and wear. The excessive strain upon the outside edges of the belt and a diagonal tension cause a torsional strain upon the belt joint. This is now, for the first time, provided for in the new 1011 Crescent jumbo plates.—Crescent Belt Fastener Co., 247 Park avenue, New York, N. Y.

Wick Feed Oil Cup

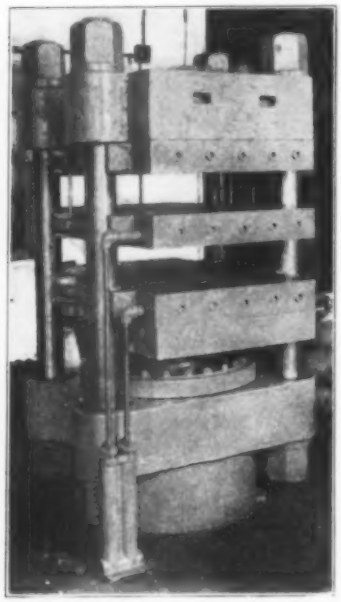
A self-acting wick-feed oil cup is here illustrated which is simple in construction, positive in action and economical in dispensing oil to the bearing. In the center of the oil cup is a tube serving as the outlet for the oil which is delivered drop by drop by means of the combination of capillary attraction which causes the oil to travel up the wick to a point near the top and an action which may be likened to the principle of the siphon which draws the oil over the bend at the highest point and delivers it down the tube to the bearing.—Hunter Pressed Steel Co., Lansdale, Pennsylvania.



"Shurflo" Oil Cup

Special Tiling Vulcanizing Press

A special hydraulic press for curing floor tiling is here pictured. It has two openings, 30 by 48 inches, and 23-inch ram for 3,000 pounds hydraulic pressure. Its improved feature consists of a patented equalizer plate set between the ram and the lower platen. This plate is so arranged that it takes up the spring caused by the thrust of the ram and allows the formation of a sheet of tiling of uniform parallel thickness that can be cut into separate tiles which will lay to a true surface without need of buffing.



Utility Floor Tiling Vulcanizer

This press is also equipped with improved multiple expansion joints to convey steam to the moving platens. — Utility Manufacturing Co., Cudahy, Wisconsin.

Nut With Six Locks

A very simple and effective nut locking device known as "Vibro" is of English invention. It has withstood successfully long continued tests of severe vibration. This nut needs no special tool nor special fitting. It follows the ordinary nut on the bolt and is screwed down till the nuts contact. Under pressure from the ordinary nut the "Vibro" locks automatically in six separate positions making a perfect lock.—Vibro Lock Nut, Ltd., 35 Copthall avenue, London, England.

Crude Rubber Cutter

A new type of cutting knife designed to slice or cut up crude rubber, sheet tiling, and other forms of rubber goods has met with favor in Europe and is now being brought to the attention of the rubber industry in the United States.

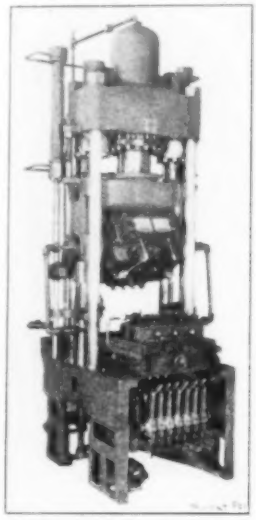
W. & P. Rubber Slicer

It is in effect a counterweighted heavy knife of special pattern operating vertically on guide posts rising on either side from a heavy cast iron base. The machine may be driven by pump or accumulator. The actual slicing stroke is done under hydraulic pressure up to about 2,000 pounds per square inch, while the upward movement of the knife is secured by action of the counterweight. A highly efficient gearing valve device allows quick operation and is designed to be handled either by hand or foot power.

By the special form of the knife the sliced pieces are pushed away from the blade so that they dump without being moved by hand, passing off from the table of the machine over the incline seen in the illustration.—Werner & Pfleiderer, Sales Agent, Baker-Perkins Co., 25 West Forty-third street, New York, N. Y.

Automatic Plastic Molding Press

The press here illustrated has been especially designed for molders of hot molding compositions and to reduce their costs of production. Every part of the operating cycle is completely controlled by a multiple-unit, motor-driven valve which is mounted on the under supports of the press as an integral part of it. The cam shaft is driven through an adjustable, speed change mechanism by a small electric motor. In addition to controlling the regular molding cycle, this valve also controls several special movements of the press, namely, that of the tilting head, of the sliding table on its supports, and the ejecting mechanism for removal of the molded objects from the dies.

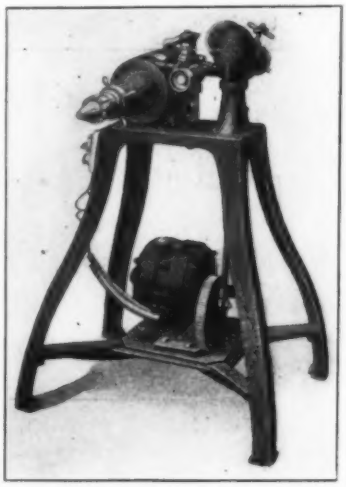


H.P.M. Universal Molding Press

The utility of this press is broadened in that it is equipped with mechanism for operating ejecting pins in both halves of the die. All its mechanism is compactly grouped and all piping is confined to the rear out of the way.—The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.

Machine for Attaching and Testing Hose Couplings

The illustration represents a machine widely used by manufacturers and large users of fire and other hose. The device will attach all sizes of couplings quickly and accurately to all kinds of hose. The expander is provided with sets of segments adapted to hose diameters and is operated by hydraulic pressure obtained by an electric motor or hand pump. Pressures required for attaching couplings to various sizes of hose are stamped on the collar of each segment size. Working with these specified pressures the operator cannot attach coupling too loose or too tight on any size of hose. The testing pump which is a part of the equipment will test hose to 600 pounds pressure.

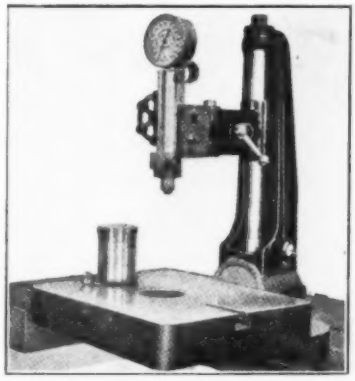


Buckley Hose Coupling Machine

This machine is built for the use of hose manufacturers, fire departments, and other large users of high-pressure hose. Where there is not a large amount of work a hand-screw operated expander is used which automatically releases the segments after the coupling is attached by simply reversing the operating handle.—The Larkin Manufacturing Co., Dayton, Ohio.

Tilting Base Scleroscope Set

The machine here illustrated is a non-portable combination of the familiar clamping stand with separate swing arm and post in combination with a standard portable scleroscope instrument. This combination gives greatly enhanced range of adaptability to the scleroscope, owing to the following new features: 1, greatly increased size to accommodate large work; 2, graduated heavy tilting table adjustable at any angle; 3, large removable center anvil for specimens that extend through; 4, ball bearing swing arm rigid enough to permit clamping down of specimens; 5, swing arm can be set in any lateral or vertical position with elastic return to lateral setting; 6, eliminates necessity for most special holding fixtures otherwise required for mass production testing of odd-shaped pieces.

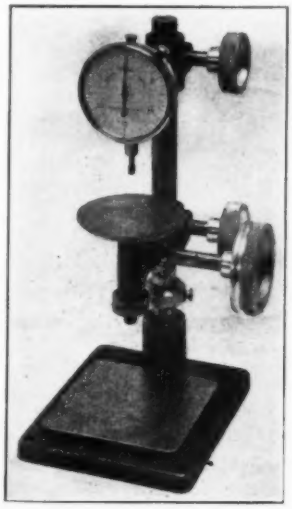


Shore's Improved Scleroscope Set

The scleroscope fitted to this machine is the same as used in the portable set, with which its dovetail bar is interchangeable. This feature enables the purchaser to make the best possible selection of equipment to meet special requirements.—The Shore Instrument & Manufacturing Co., Jamaica, New York.

Micrometer Dial Bench Gage

An improved model of a familiar type of micrometer dial gage is here illustrated. It embodies three features new in such gages: 1. The knurled handle which raises the table carrying the work against the indicator spindles is grooved and has a hole in the groove. A cord can be inserted in this hole and run over the groove so as to raise the table by foot pressure leaving free both hands of the operator; 2, the table can be swung aside and the base of the instrument used for a table for gaging large pieces; 3, the graduations of the indicator are further apart than usual, having only 0.030 graduations to one turn of the index. It is also graduated to 0.0005, as shown by the short lines between the longer ones on the dial.—Federal Products Corporation, Providence, Rhode Island.



Improved Federal Bench Gage

Safety Collar for Shafting

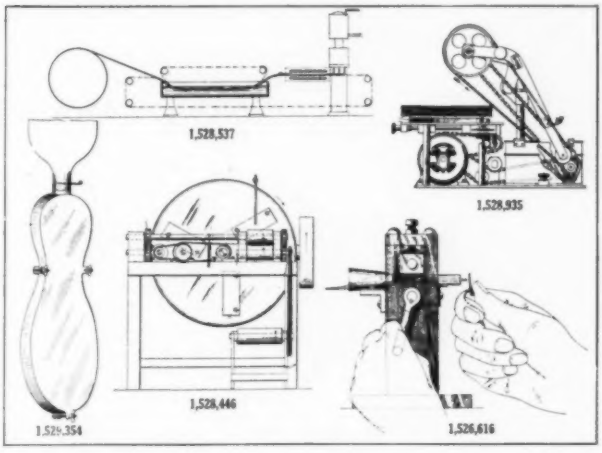
A new safety collar intended to maintain the proper alinement of such equipment as pulleys, shaft bearings, hangers, etc., has recently been perfected. Great strength, toughness, durability, and light weight have been incorporated in this new malleable iron collar. It is made either in two pieces or solid, both types being accurately machine finished assuring a tight fit and neat appearance. The set screw, by which the collar is firmly fixed to the shaft, is flange protected.—Link-Belt Co., 910 South Michigan avenue, Chicago, Illinois.

Machinery Patents

The United States

(1,526,616). FORMING AND APPLYING TABS TO SHOE BUCKLES. A pair of rolls adapted to feed forward a strip of tab forming rubberized fabric, has a die on the face of one roll acting against the face of the other to partially sever the strip into tab-lengths, as the tab strip is fed forward by the rolls. A folder is arranged to plait the strip as it advances through a guide sleeve on the delivery side of the rolls. Here the operator applies the slotted end of the buckle over the tab stock and folds it back upon itself in adhesive attachments.—R. W. Stuart, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,526,616.

(1,528,446). RUBBER CUTTING MACHINE. This machine is designed for cutting elastic rubber bands from lengths of flat tubing. The cutting mechanism is supported on a frame above a conveying belt for removing the cut bands. The cutting blades are mounted at intervals on the face of a heavy disk wheel mounted on the main



shaft and operated by power through a pair of bevel gears. The blades are spaced away from the wheel mount to allow the cut bands to drop to the conveyor belt as the blades sever them from the tubing by a shearing cut in conjunction with a fixed blade on the frame. The tubing to be cut is fed to the cutters by a gear driven device arranged to advance it between cuts and allow it to remain stationary while cutting is in progress.—Charles B. Martin, Portland, Oregon. United States patent No. 1,528,446.

(1,528,537). PRODUCTION OF FILAMENTS OR THREADS. A continuous process for the curing of rubber thread comprises a bath for molten sulphur, and means for leading continuously through the latter a round rubber filament issuing from a press after evaporation of its contained solvent. On leaving the sulphur bath the filaments are at once coiled up into desired lengths or removed in any other convenient manner. The rubber paste can be mixed with about 10 per cent of sulphur, so that as soon as the filaments enter the sulphur bath the vulcanizing process begins, since the filaments at once assume the temperature of the bath. The liquid sulphur is heated to about 130 degrees C. Compared with the usual process of cutting filaments from cured sheet stock, this process permits a reduction of one third the cost of operation.—Max Draemann, Cologne, Germany. United States patent No. 1,528,537.

(1,528,935). Edge Coating Machine. This machine is designed to apply rubber cement to the edges of a stack of cut pieces such as shoe lining fabric. Stacks of such pieces supported on a metal plate of corresponding form are elevated on an underlying block, part of the edge of which runs parallel with the margin of the work which is to be cemented. This block is bordered on all sides but one by a vertical strip or flange. This strip is adapted to rest upon the table to support the work carrier, and to be driven between rollers to feed the work as the work carrier slides upon the table. From one section of a two-compartment cement tank the cement is conveyed by a belt made of an endless spiral spring with closely spaced coils. In operation the work upon its base plate is revolved by the feed mechanism and as it passes the cement carrying belt the upper piece receives an application of cement around its margin, and the operator removes the cemented top piece of stock.—Frank J. MacDonald, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,528,935.

(1,529,354). Molding Fibrous Composition Articles. As applied to making shoe soles the apparatus consists of a container connected by a conduit to a mold the walls of which are composed of nonporous material. The mold consists of two similar plates connected together at their edges by a curved wall. The mold walls are held together by a clamping device. Wet fibers held in the container are admitted to the mold, which is packed full by pressure or tamping, and the supply of material is shut off by a valve below the container. The molded article is then removed, dried and vulcanized. This method provides an article which offers high resistance to tearing action or any tendency to separate the matted material into laminated; nor is there any waste of material.—Abel H. Hamblet, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio. United States patent No. 1,529,354.

Other Machinery Patents

The United States

1,526,345 Washer placing machine for rubber heel molds. J. H. Kintzele, St. Louis, Missouri, assignor of one-half to Dryden Rubber Co., Chicago, Illinois.

1,526,594 Apparatus for manufacturing tires. J. R. Gammeter, C. W. Leguillon, and W. D. Kmentt, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.

1,527,161 Apparatus for curing inner tubes. L. W. Allen, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts.

1,527,175 Tire stitching device. C. H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,527,194 Trimming machine. H. P. Kelly, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,527,206 Tire mold. M. A. Marquette, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts.

1,527,925 Safety device for machines. J. W. Schade, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,527,953 Apparatus for producing moldable blanks of plastic material. E. E. Davidson and J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,528,107 Apparatus for making cellular articles. J. O. Goodwin, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,528,659 Apparatus for manufacturing pneumatic tires. B. De Mattia, Clifton, New Jersey.

The United Kingdom

226,272 Apparatus for vulcanizing hollow articles. C. H. Gray, 106 Cannon street, London, England.

226,420 Apparatus for vulcanizing sheathed cores. Western Electric Co., Ltd., Aldwych, London, England. (Western Electric Co., Inc., 463 West street, New York, N. Y., U. S. A.)

The Dominion of Canada

246,903 Mixing machine. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., Canada, assignee of E. Eger, Detroit, Michigan.

247,137 Bias cutter. The Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario, assignee of E. D. Putt, Akron, Ohio.

247,330 Mandrel support. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of G. L. Mather, Milwaukee, Wisconsin, both in U. S. A.

247,331 Tire mold. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of D. E. Hennessy, Milwaukee, Wisconsin, both in U. S. A.

247,332 Vulcanizing apparatus. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of D. E. Hennessy, Milwaukee, Wisconsin, both in U. S. A.

247,573 Apparatus for making cushion tires. The Lambert Tire & Rubber Co., Barberton, Ohio, assignee of H. M. Lambert, Portland, Oregon.

Germany

Patents Issued With Dates of Issue

409,081 (March 23, 1924). Tire repair device. Armand Eymael and Michel Dall 'Este, Brussels, Belgium. Represented by C. Clemente, Berlin S. W. 61.

409,082 (June 9, 1923). Machine for making tire covers. Claude Marie Gautier, London. Represented by E. Herse and Hillecke, Berlin S. W. 61.

Design Patents Issued With Dates of Issue

893,002 (November 9, 1923). Spreading machine with solvent recovery apparatus. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

894,126 (November 11, 1924). Spreading machine with device for recovering solvent. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

895,817 (October 18, 1924). Vulcanizing apparatus for joining rubber belts to make them endless. Franz Clouth, Rheinische Gummiwarenfabrik A.-G., Köln-Nippes.

896,165 (December 12, 1924). Apparatus for making seamless, soft rubber hollow goods. Werner Tuphorn, Konstanz a. B.

896,860 (December 22, 1924). Device for pleating rubber. Harburger Gummiwarenfabrik Phoenix, A. G., Harburg a. E.

Process Patents

The United States

1,527,720 Process of making self-sealing tire tubes. W. W. Wildman, assignor to The Wildman Rubber Co., both of Bay City, Michigan.

1,528,263 Process of forming gaskets. W. J. Peelle, Chicago, Illinois.

1,528,453 Method of producing rubberized interlinings. M. Recher, assignor to Recher Bros., Ltd., both of Brown Mills, New Jersey.

1,528,956 Method of making rubber covered roller. F. L. Smith, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,529,033 Method of making coated cellular structure. A. B. Merrill, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

The United Kingdom

225,897 Method of making rubber paving blocks. J. S. Cowper, 24 Queensberry Place, South Kensington, London.

226,030 Method of molding rubber heels, etc. L. Gaisman, Canning street, Audenshaw, near Manchester.

226,340 Method of inserting colored strips in ebonite. Fuller's United Electric Works, Ltd., Woodland Works, Grove Road, Chadwell Heath, and A. P. Welch, 33 Eastwood Road, Goodmayes, both in Essex.

226,422 Method of making artificial leather impregnated with rubber. K. L. Moses, 56 Marshall street, Brookline, Massachusetts, U. S. A.

226,965 Method of making tennis balls. C. E. Allsopp, Aberdona Villa, Dollar, Clackmannanshire.

227,056 Method of applying rubber composition soles and heels. J. H. Stowe, 58 Bondgate, Otley, Yorkshire.

The Dominion of Canada

247,482 Process of producing a rubber-impregnated paper product. K. L. Moses, Brookline, Massachusetts, U. S. A.

247,572 Method of manufacturing cushion tires. The Lambert Tire & Rubber Co., Barberton, Ohio, assignee of H. M. Lambert, Portland, Oregon, both in U. S. A.

Germany

Patents Issued With Dates of Issue

407,921 (August 30, 1923). Method and rubber sole for making footwear with leather uppers and rubber sole. Vereenigde Nederlandsche Rubberfabrieken, Doorwerth b. Arnheim, Netherlands. Represented by R. Schmehlik and C. Satlow, Berlin S. W. 61.

409,452 (May 24, 1922). Method of making soles from rubber masses. Reinhold Gollert, Neue Schönhauserstrasse 20, Berlin.

409,927 (July 1, 1920). Method of making inner tubes. Paramount Rubber Consolidated, Inc., Philadelphia, Pennsylvania, U. S. A.; represented by: Dr. B. Bloch, Berlin S. W. 21.

BRITISH RIM TOOL

The H. F. rim tool is a very effective appliance which has been improved recently by the provision of an adjustment which greatly facilitates its use with Kelsey type rims, which are the hardest to contract. For springing these rims apart slightly before they can be contracted a short steel lever is provided which is inserted between the jaws of the tool. This secures the initial opening necessary to enable the operator to pull the lever over and fully contract the rim.—Harvey Frost & Co., London, England.

New Goods and Specialties

Polson-McWade Puncture Sealing Tube

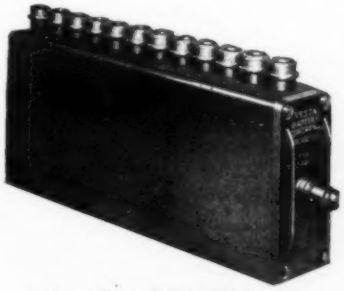
The manufacturers of the Polson-McWade puncture sealing tube claim that it can be stretched to eight times its original length and will return, because it contains 93 per cent of the highest grade rubber; the compound including a large portion of antimony and other pigments, is said to give greatest resistance to heat and abrasion. The tube is concave on the tread side so that when inflated the rubber on the inside of the air chamber next the casing is compressed. An object puncturing the tube is immediately surrounded by compressed rubber and when withdrawn the compressed rubber follows it into the opening made, thus sealing it. The kneading action of the rubber when the car is in motion practically vulcanizes it.—The Polson Rubber Co., Cleveland, Ohio.

Additions to the Norwalk Tire & Rubber Co's Line

A 30 by 3½ double duty gray tube has been added to the line of the Norwalk Tire & Rubber Co., Inc., Norwalk, Connecticut. It is of extra heavy gage and is designed to lengthen the life of both the tube and casing of the clincher type. It is claimed that it will also practically eliminate tube pinching. Three sizes have been added to the heavy duty truck and bus line: the 36 by 8, 34 by 7 and 33 by 4, thus completing the line from 29 by 4½ to 40 by 8.

A Soft Rubber "B" Battery

Storage batteries with hard rubber cells are now well known, but a recently developed battery has a soft rubber cell, or rather a series of semi-soft rubber cells fastened together to make a unit exactly half the bulk of the usual "B" storage battery. The new battery is designed to supply the current for the grid or plate circuit in radio amplifier tubes, and is called a "B" battery to distinguish it from the "A" battery used to make the filaments in the tubes glow for reception. A special silica compound is said to be used in the molded rubber; there is no wood, glass, or other brittle material in the battery, and the finish is a smooth, acid-proof brown which, the manufacturers state, is always dry and clean. The 24-volt units have a capacity of 4,000 mille. ampere hours, and it is claimed not only that they are short-circuit and corrosion-proof but that they will hold their charge for a longer period than the old open type.—Vesta Battery Corporation, Chicago, Illinois.



Vesta Type RD2 "B" Battery

Losant Air Tool Hose

The manufacturers claim that the Losant, a hose built to convey air under high pressure, needs no wire armor to protect it when dragged over rocks, or over corners of steel beams or over abrasive materials—treatment to which air tool hose is unavoidably subjected. The tube and cover stock is extra heavy and made from a special rubber compound designed to give the greatest possible resistance to hard wear and exacting service.—The Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, U. S. A.

Rubber Bathing Beach Novelties for 1925

The "Kiddiefloat" illustrated below is the most novel of the season's contributions thus far to bathing beach accessories. It is a kind of inflatable life preserver of pure rubber molded in frog and duck design and with colors vulcanized in the rubber. This looks like the solution of the problem of the amusement of the small child at the seashore and consequently bids fair to be a "best seller."

Crêpe Rubber Sandal

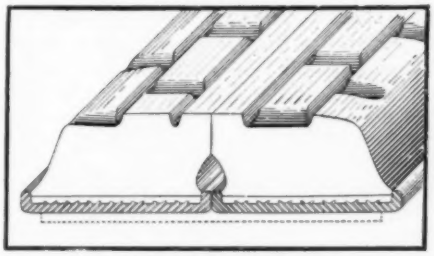
The same manufacturer is offering a very decided improvement on the crêpe rubber bathing slipper, which became so popular last season. This has the effect of a sandal, but is snug-fitting at toe and heel and has an ankle band which is molded in one with the decorative bands across the top, around the sides and the sole, including the toe-cap.

Two Designs of the Kiddiefloat

The cut-away is not for style only but is designed to allow water which may get into the slipper to escape under the arch of the foot. An inner sole of natural rubber is sufficiently thick to afford protection from sand. Bright-colored crêpes with bands of contrasting colors are used, and well-fitting caps in various designs, some with two plies of rubber in contrasting shades, are provided to match.—E. A. Guinzburg, 302 Fifth Avenue, New York, N. Y.

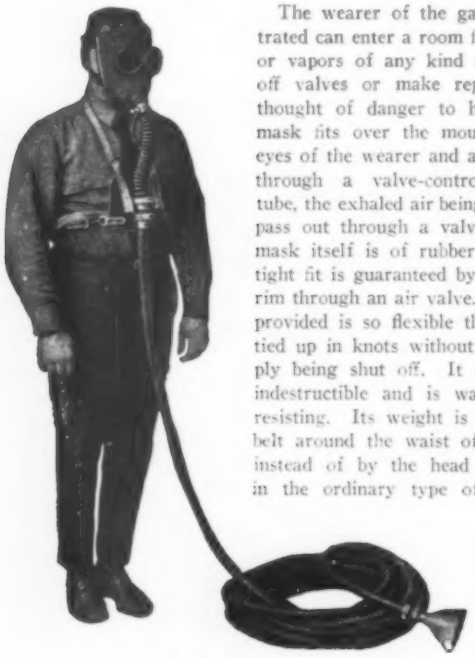
New Heavy Duty Cushion Tire

This latest development in a cushion tire available for heavy trucks adapts for heavy duty the well known hollow center principle of cushioning heretofore available only in sizes up to eight inches. The tire is made in two sections, each section being a complete tire in itself, but when applied to the wheel the abutting faces of the sections meet and form a pressure sealed hollow center which allows a free internal displacement of the tread under load. These heavy duty cushion tires are available in sizes up to and including 16 inches, and they have the same carrying capacity as solid tires of equal size, and fit all S. A. E. Standard solid tire truck wheels.—United States Rubber Co., 1790 Broadway, New York, N. Y.



U. S. Heavy Duty Cushion Tire

Workman's Rubber Gas Mask



Rubber "Gaso" Protector

The wearer of the gas mask illustrated can enter a room filled with gas or vapors of any kind and can shut off valves or make repairs without thought of danger to himself. The mask fits over the mouth, nose and eyes of the wearer and air is supplied through a valve-controlled flexible tube, the exhaled air being permitted to pass out through a valve port. The mask itself is of rubber and an air-tight fit is guaranteed by inflating the rim through an air valve. The tubing provided is so flexible that it can be tied up in knots without the air supply being shut off. It is practically indestructible and is water and gas resisting. Its weight is carried by a belt around the waist of the wearer instead of by the head or neck, as in the ordinary type of gas mask.

The device weighs about 7 pounds.—The Safety Equipment Service Co., 1228-34 St. Clair Avenue, Cleveland, Ohio.

"Golfrite" Balls

The Burke Golf Co., Newark, Ohio, has devised a plan by which golfers may identify their balls when the members of a foursome are all using the Burke balls. "The Golfrite" balls are marked with a red heart or a red diamond, a black spade or black club, the symbols used on playing cards.

Tennis Ball Filled with Nitrogen

A new tennis ball which is claimed to be absolutely airtight, with no possibility of leakage through joints, the plug, or the rubber wall itself, has been invented by Albert E. Penfold, technical expert of the Dunlop Rubber Co., Ltd. It is filled with nitrogen, and will be made by the Dunlop company.

Another Improvement on the Lew-Mar Bathing Cap

The Lew-Mar "Submarine" bathing cap, which made its first bid for popularity on the molded rubber ribs which held the cap snugly to the head but lifted it behind and around the ears in a way which avoided pressure on the ears but at the same time excluded water, has been twice improved. The first improvement was a pocket for the ears, which was built out over the ribs and did not necessitate another bathing cap over it. Now to this ear pocket is added a chin strap molded at an angle to keep it away from the throat, which will prevent the cap from slipping off and insure comfort in diving. All three of these models are made in six regular colors.—Lew-Mar Products Co., 229 Fourth avenue, New York, N. Y.

Bobbin racks, which are a necessity in handling art silk, are equipped with large rubber-tired casters which act as shock absorbers. They are made by Oswald Lever Co., Inc., Philadelphia, Pennsylvania.

Rubber Cloth Golf Bags

The Pocono Rubber Cloth Co., Trenton, New Jersey, manufacturer of automobile topping and rubberized fabrics, is putting out

Pocono Rubber Co's "Par-Bag"

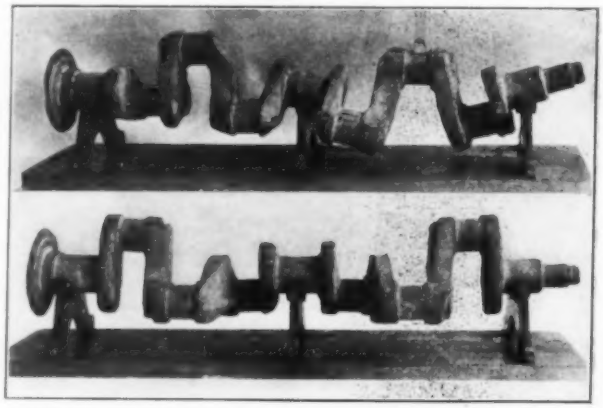
a full line of golf bags retailing from $1.50 to $45.00 each. The "Par-Bag" illustrated herewith is said to be making a strong bid for popularity.

Rubber Crankshaft

A rubber crankshaft was used at the Detroit meeting of the Society of Automotive Engineers, by C. E. Summers of the General Motors Research Corporation in his discussion on engine vibration and balance.

The crankshaft of an automobile engine is subjected to very complex and rapidly changing forces. It yields torsionally due to the turning effort of the engine vertically under the thrust of the pistons, and radially owing to centrifugal force. The actual movement of the shaft at any point is a composite of these various motions. Furthermore, the tendency toward periodicity and reaction causes the shaft deflection and stresses to be much greater at certain critical speeds than would occur under the normal forces in the engine.

A steel crankshaft is a fairly rigid member and it is difficult to study the distortions because it requires a great deal of force to produce a little distortion. Therefore, the measurement must be very accurate, and frequently the supporting members yield

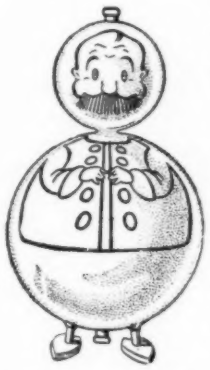


Relative Deflection of a Rubber Crankshaft Is Same as Steel

more than the shaft, introducing serious errors. In order better to study these deflections under complex stresses, the rubber crankshaft shown herewith was molded in the exact form of a conventional steel crankshaft. The great elasticity of the rubber permits the shaft to yield sufficiently so the strain of the various elements can be studied by observation and simple measurement. The character of the rubber is such that the relative deflection of various parts is almost precisely the same as occurs in the steel crankshaft.

The "Tumbleloon" Inflatable Doll Novelty

A toy balloon development which never fails to get the smiles of the crowd, whether exhibited by street hawkers, in stores, or among the children only, is the "Tumbleloon," an inflatable doll painted to depict well known comic characters and provided with a pair of tiny feet on which it lands when thrown in the air or when knocked about in any direction. A special balancing device provides for its return to perpendicular, whatever may be given it in the way of rough treatment.—Anderson Rubber Co., Akron, Ohio.



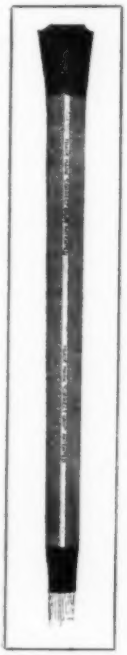
The "Tumbleloon"

"Red X" Friction Tape

The "Rex X" brand denotes first quality goods, says the manufacturer, and the 1925 list of products includes many repair items, among which special attention is called to "Red X" friction tape, put up in 1, 2, 4, and 8-ounce cartons, ¾ inch wide, 50 pounds of a size in a shipping container. This tape is guaranteed for one year against drying out.—St. Louis Rubber Cement Co., Inc., 3951-3953 Laclede avenue, St. Louis, Missouri.

All-Rubber Golf Grip

The latest improvement to the "Correct Golf Grip" combines tip and grip in one, so that it requires only two minutes to fit it on the club. The tip is of plain rubber with border ribs, and the grip is finely corrugated, giving a non-skid hold which the manufacturers claim will take strokes off the golfer's game as well as save his hands.



"Correct Golf Grip"

The grip is very easily applied, being tapered down to the staff so that no whipping is required. Clubs may, however, be purchased already equipped with them at factories or retailers.—Armstrong Grip Corporation, 1222 North Charles street, Baltimore, Maryland.

Punctureproof Wheel

A recently patented punctureproof wheel has a hub, a rim, flexible metallic disks backed by air-tight fabric disks and located against the opposite sides of the hub and rim, thus forming a single annular chamber for the reception of fluid. Radial springs are provided in the chamber between the hub and the rim and transverse springs in the chamber between the disks. A hub box extending through the hub has holding means that clamp the central portions of the disks. Outwardly flanged clamping rings are secured to the opposite sides of the rim, clamping the peripheral portions of the disks to the rim. The flanges of these clamping rings project beyond the rim, thus providing a location for the tire.—T. L. Ruth, Inventor, 1311 South Fourth street, Wilmington, North Carolina.

Rubber Band Device for Removing Hairs

An improvement on a Chinese device for removing hairs individually employs a scissors-like frame with rubber bands so placed as to form a V-space in which the hair is trapped when the scissors close. It is then twisted in the rubber bands and yanked out with the opening of the scissors.

Rubber Fruit and Flowers

Rubber lends itself admirably to making imitation fruits and flowers in natural colorings. A European firm is marketing in boxes containing a dozen or half-dozen, apples, oranges, bananas, peaches, pears, and other fruits, and also flowers for decorative purposes, made entirely of rubber. J. Thompkins & Co., Ltd., 386 City-road, London, E. C., England, is the selling agent.

The Smokador Tube Holder for Cigarettes

A device whereby the motorist may enjoy a cigarette without having his car littered with the ashes and also without having his vision blurred is called the "Smokador," and consists of a hard rubber holder for the cigarette, a soft rubber suction cup by which it is held against the glass or wherever it may be desired to place it, and a long flexible covered-rubber tube with a mouthpiece at the end. The illustration shows it fastened securely to the outside of the windshield, leaving the driver's hands free and his car clean and safe from fire hazard.—Smokador Manufacturing Co., 130 West 42nd street, New York, N. Y.

Jack Gilbert, the Movie Star, Enjoying the Smokador

"Longwear Black Beauty" Cord

The International Rubber Co. of America, Anderson, Indiana, has announced a new all-black tire, with 15-ounce cord casing of full ply construction, the trade name being given as "Longwear Black Beauty." Even the customary red band which identifies the Longwear brand has been omitted, in order to stress the all-black quality.

Valve for Inflatable Rubber Articles

Joseph P. Dooling, New Haven, Connecticut, has patented a valve for inflatable rubber articles which comprises a casing with a longitudinal chamber closed at its inner end and having in one side of the chamber near the inner end a port and an expansible port closure seated in the inner end. A plunger bears on this port closure, and a screw plug mounted in the outer end of the chamber is adapted to force the port closure inward, thus causing it to expand and close the port.

BEMIS ASSOCIATES, INC., 294 PLEASANT STREET, WATERTOWN, Massachusetts, is marketing a splicing tissue specially designed for the paper trade and having the trade name, "Diamond B."

The Editor's Book Table

Book Reviews

"CHEMISTRY IN INDUSTRY." EDITED BY H. E. HOWE. THE Chemical Foundation, Inc., 85 Beaver street, New York, N. Y., 1924. Cloth, 372 pages, 5½ by 8 inches, charts, diagrams and illustrations.

THIS is a cooperative work intended to give examples of the contributions made to industry by chemistry, and written primarily for the use of students.

There are 21 chapters, in which the chemical aspects of different industries are entertainingly discussed in non-technical language by well-known industrial and research chemists specializing in the industries treated. The stories are therefore authoritative, informing, and full of inspiration for the student. They are of no lesser interest to the general reader desiring to gain a general view of the relations of chemistry in some of the practical concerns of modern life.

The chapter on chemistry in the rubber industry is by W. J. Kelly, who is well known for his rubber research work, particularly on vulcanization.

The correlation of these essays into an entertaining volume has been well done by the editor.

"PROCEEDINGS OF THE TWENTY-SEVENTH ANNUAL MEETING of the American Society for Testing Materials." 1924. Published in two volumes by the A. S. T. M., 1315 Spruce street, Philadelphia, Pennsylvania. Volume 24, Part I, 1173 pages. Part II, 1133 pages, illustrated.

The proceedings, reports and technical papers of the A. S. T. M. summarize annually, to date, the development, standardization, and methods of testing practically all industrial and engineering materials.

Part I contains a summary of the Proceedings of the Twenty-seventh Annual Meeting, annual address by the president, and annual report of the Executive Committee followed by reports of the numerous technical committees, A. S. T. M. standards, tentative and revised. Part II contains 49 technical papers with discussions.

The technical papers are classified under the following headings: Symposium on Effect of Temperature Upon the Properties of Metals; Symposium on Corrosion-Resistant, Heat-Resistant and Electrical-Resistant Alloys; Fatigue Metals; General Metals; Concrete, Gypsum and Brick; Paints and Oils; Timber; Testing and Testing Apparatus; Standardization.

"RUBBER ON THE MARKET AND IN THE FACTORY—REPORT on Visits Made to Markets and Factories in Europe and America in 1921." By Dr. O. De Vries, director of the Central Rubber Station, Buitenzorg, Java. Published by De Nederl. Boek-en Steendrukkerij Voorheen H. L. Smits, 's-Gravenhage, Holland. Paper, 128 pages, 6 by 9½ inches.

Originally published in the Dutch language, this report has been translated into English by the International Association for Rubber and Other Cultivations in the Netherlands Indies. The eight chapters of this publication cover such subjects as "Market and Trade," "Packing," "Treatment of Rubber in the Factories," "Sampling and Testing," "Inner Properties Desired in Plantation Rubber," and "Special Methods of Preparation."

"COTTON FACTS—A COMPILATION FROM RELIABLE SOURCES of the Crops, Receipts, Stocks, Exports, etc., of Cotton and Cotton Products." Revised and enlarged by C. W. Shepperson. Published by the Shepperson Publishing Co., Hanover Square Building, New York, N. Y. Cloth, 255 pages, including index, 4 by 7 inches.

First published almost a half century ago, this 1924 edition of a standard work of reference for the cotton industry continues to supply much interesting and valuable data. Aside from the many tables of statistics, the present volume contains a review of the cotton season of 1923-1924, and also indicates the prospects for 1925. A new and important feature is a combination table of daily spot cotton prices in New York, New Orleans, and Liverpool.

"THE STORY OF BAKELITE." BY JOHN KIMBERLY MUMFORD. Published by Robert L. Stillson Co., 461 Eighth avenue, New York, N. Y. Cloth, 80 pages, illustrated, 5½ by 8½ inches.

In the twelve chapters of this little volume the author traces the history of bakelite from prehistoric ages to the discovery in 1907 by Dr. L. H. Baekeland of the process of manufacture. The many present-day uses of the product are pointed out, the last chapter of the volume being entitled "The Wartime Story of Bakelite—Radio and the Airplane."

Recent Articles Relating to Rubber

Note of the Theory of Vulcanization. The physical effect of vulcanization is in part the outward manifestation of a chemical change in the rubber hydrocarbon, this change being induced by the chemical action of the sulphur on a relatively small proportion of the rubber. The induced reaction can hardly be other than a polymerization of the remaining caoutchouc molecules. Such polymerization of a hydrocarbon is not novel. The idea of an induced reaction is in agreement with the relative results of vulcanization by the customary method using ordinary sulphur and by the very rapid methods involving the application of reagents which yield the highly active nascent sulphur.

The question then arises as to whether the "rubber sulphide," as the reaction product of sulphur with a small proportion of the rubber may conveniently be termed, has any further influence on the rubber. The answer appears to be a decided affirmative. The main effect of vulcanization indeed appears to be due to this.—D. F. Twiss, *Journal of the Society of Chemical Industry*, March 6, 1925, 106T—108T.

Vulcanization and Accelerators. Part II. Natural and mineral accelerators. Serial.—André Dubosc, *Rubber Age*, New York, February 25, 1925, 335-6, March 10, 1925, 370-371.

"Hector's Bases" as Accelerators of Vulcanization, and the Formation of Elastic "Sulphur." Hector's reaction for the production of basic compounds by the action of oxidizing agents, such as hydrogen peroxide, on aromatic thiocarbamides if applied to monophenylthiocarbamide yields a crystalline substance, m.p. 181 degrees C.

This is a good accelerator of vulcanization, particularly if used in conjunction with zinc oxide. The corresponding compound obtained from mono-*o*-tolylthiocarbamide is an even more active accelerator, but those derived from *s*-diphenylthiocarbamide (thiocarbanilide), *s*-di-*o*-tolylthiocarbamide, and α-phenyl-β-methylthiocarbamide are of negligible effect. The possibility arises that the known activity of mono-substituted derivatives of thiocarbamide as accelerators may be due to their convertibility into Hector's bases. The elementary sulphur liberated in Hector's reaction is first obtained as a colloidal dispersion, but later undergoes coagulation to an elastic mass comparable with the elastic sulphur of Iredale.—E. Romani and C. Pelizzola, *Le Caoutchouc et la Gutta Percha*, 1925, 25, 12,506-7.

Size and Character of Grains of Non-Metallic Mineral Fillers.—W. M. Weigel, U. S. Bureau of Mines, Technologic Paper, 296, 1924.

Chemical Problems in Insulating Varnishes. Discussion of the requirements of insulating varnishes for the electrical industry, and the processes for production of varnish film.—H. C. P. Weber, *The Rubber Age*, London, March, 1925, 31-32.

The Mechanism of the Formation of Thiocarbanilide.— Stanley James C. Snedker, *Journal of the Society of Chemical Industry*, February 20, 1925, 74T—76T.

The Calender in the Rubber Industry. A review of the development and use of the calender for rubber working. The methods of use described include sheet rubber production, friction operations, cord insulation, wet friction methods, profiling tire treads and figuring uppers, soles and matting. Calender grain, roll speeds and stock shrinkage are also discussed.—W. G. Martin. Illustrated paper read before the Institution of the Rubber Industry, February 2, 1925. *The Rubber Age*, London, March, 1925, 21-31.

The Acceleration of Vulcanization, Part I. An accelerator can be defined as a substance which, added to a rubber-sulphur mix, reduces the time necessary for vulcanization. It could not be described as a catalyst, there being little doubt that most accelerators take part in the reaction irreversibly. A more apt definition would be that an accelerator is a substance which, added to a rubber-sulphur mix, gives a vulcanized product with better properties than would be obtained from the same mix without its use. The advantages gained by using accelerators are: shortening of the time of cure, improving the mechanical properties and aging qualities of the vulcanizate, reduction of "blooming" to a minimum, vulcanizing at low temperature, softening of the mix, and a lessening of the variability of raw rubber.—W. J. S. Naunton, Manchester Section, Society of Chemical Industry, February 5, 1925.

A Car Manufacturer's Experiences with Balloon Tires.—E. A. De Waters. *Journal of the Society of Automotive Engineers*, March, 1925, 342-344.

Paranitrophenol as a Mould Preventive. Part III. A series of crêpe and smoked sheet rubbers in the preparation of which a small quantity of P. N. P. was used as a mould preventive were tested in a pure rubber-sulphur mix in the presence of accelerators. The results of the tests indicated that P. N. P. has no harmful effect on the vulcanization rate of rubber.—H. P. Stevens, *Bulletin of the Rubber Growers' Association*, February, 1925, 109-110.

Investigations of the Coagulation of Latices.—R. Audubert, *Revue Générale des Colloïdes*, December, 1924, 353-361. Illustrated.

Rubber in Indo-China. Detailed history of the production of rubber in Indo-China; the different wild rubber producing lianas; experiments in the cultivation of various rubber yielding plants; methods of exploitation, preparation, and the present state of Hevea culture in Indo-China.—L. Carton, *Bulletin Economique de l'Indochine No.* 167, *IV*, 1924, 349-449; tables, graphs, illustrations, references, index, map.

Accelerators. (German.) A review of the literature and patents on vulcanization accelerators covering 137 references to the literature of the subject.—Dr. L. Stoll, *Gummi Zeitung*, March 6, 1925, 752-755.

MEETING AND DINNER OF N. A. W. M. D.

Egmont L. Frankel, of Frankel Bros., Ltd., Toronto and Montreal, Canada, was elected president of the National Association of Waste Material Dealers, Inc., at the twelfth annual meeting, held on March 18, in the Hotel Astor, New York, N. Y. Other officers elected were: Henry Lissberger, first vice-president; G. H. Rady, second vice-president; and E. B. Friedlander, of the Lowenthal Co., third vice-president.

The Scrap Rubber Division met on March 17, and E. B. Friedlander was chosen chairman for the coming year. Lack of cooperation by reclaimers was discussed and it was decided to bring this matter to the attention of the Rubber Reclaimers' Division of the Rubber Association of America.

More than 600 members and guests attended the twelfth annual dinner of the association on the evening of March 18, at the Hotel Astor, New York, N. Y., which brought the two-day convention to a fitting close. Good fellowship, songs and speeches marked this dinner as one of the most enjoyable in the association's history.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS.—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

New Trade Publications

"ELIMINATION OF WASTE, SIMPLIFIED PRACTICE: WHAT IT IS and What It Offers," is an illustrated bulletin prepared by the Department of Commerce, Washington, D. C. This publication contains important data under the two heads: "General: Services Offered by the Division of Simplified Practice of the Department of Commerce," and "Detailed Summary of Examples in the Application of Simplified Practice." Rubber heels are among the commodities mentioned as being at present in process of simplification.

SPECIFICATIONS AND DATA CONCERNING FALK-BIBBY FLEXIBLE couplings are being published in an illustrated bulletin prepared by The Falk Corporation, Milwaukee, Wisconsin.

TWO ILLUSTRATED BULLETINS DESCRIPTIVE OF TWO SPECIAL TYPES of speed transformers are being sent out by The Poole Engineering & Machine Co., Baltimore, Maryland, manufacturer of gears and power transmission machinery for rubber manufacturers.

"HANDBOOK FOR THE USE OF HYCOE" IS AN ILLUSTRATED BOOKLET describing a special type of brake lining produced by The Manhattan Rubber Manufacturing Co., Passaic, New Jersey.

A FULLY ILLUSTRATED CATALOG ENTITLED "MECHANICAL AND Molded Rubber Goods of the Highest Quality" indicates some of the many lines produced by The Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio.

ONE OF THE SPECIAL TRADE INFORMATION BULLETINS ISSUED BY the Department of Commerce, Washington, D. C., and entitled "Planning Salesmen's Territories" will be of interest to all manufacturers.

AN INTERESTING CALENDAR FOR 1925, PUBLISHED MAINLY IN THE Chinese language, has been received from the Sin Kuo Min Press, 120 Cross street, Singapore, Straits Settlements.

IN AN ILLUSTRATED BOOKLET ENTITLED "THE RUBBER INDUSTRY in Edinburgh—A Review," is published a lecture delivered some months ago by W. A. Williams before the Royal Scottish Society of Arts, Edinburgh, Scotland. Mention is made of the activities of the leading rubber organizations of the city, particularly the North British Rubber Co., Limited.

THE FOLLOWING HOUSE ORGANS HAVE BEEN RECEIVED DURING THE last few days: "Mohawk Messenger" and broadside from The Mohawk Rubber Co., Akron, Ohio; "Dunlop Merchant News" and "Pure Para" from the Dunlop Tire & Rubber Co., Buffalo, New York; and "The Wingfoot Clan" from the Goodyear Tire & Rubber Co., Akron, Ohio.

Interesting Letters from Our Readers

Status of D. P. G. Litigation

TO THE EDITOR:—

DEAR SIR: Regarding the accelerator litigation that was so prominently before the rubber industry a few years ago, I can state that from my company's viewpoint the litigation is far from settled and that it has been actively progressing since the last decision rendered by the Circuit Court of Appeals for the Second Circuit.

After a thorough examination of the record of the previous trial and after giving careful consideration to the defense set up by our opponent, we decided to bring up the case in another circuit and thus endeavor to get it to the Supreme Court of the United States for a final hearing.

Therefore, some time ago we entered suit against the Corona Cord Tire Corporation, East Butler, Pennsylvania, charging direct infringement, and we expect this case will come to trial during June of this year.

New York, N. Y.
March 25, 1925.

HENRY S. DOTY,
Pres. Dovan Chemical Corp.

Customs Appraisers' Decisions

Cushion Inner Tires for Automobiles (T. D. 40619). Collector of Customs, New York. Decided January 14, 1925.

Very light and resilient tubes, consisting of a molded cushion type of the size and shape to fit the outer casing, were held dutiable under paragraph 369, tariff act of 1922, as manufactures in chief value of rubber.—*Treasury Decisions*, Volume 47, No. 4, page 3.

No. 48306.—Protest 26032-66759 of Marion Warner (Chicago).

Golf shoes with a nonslipping attachment in the shape of a rubber disk the size of a nickel, classified as exercise equipment at 30 per cent ad valorem under paragraph 1402, tariff act of 1922, are claimed free of duty as shoes made wholly or in chief value of leather under paragraph 1607. Opinion by Sullivan, G. A. Golf shoes were held not *ejusdem generis* with the balls, clubs, rackets, and bats mentioned in paragraph 1402. G. A. 8780 (T. D. 40143) and Abstract 46948 cited. They were held specifically covered by paragraph 1607 which provides for shoes in chief value of leather. —*Treasury Decisions*, Volume 46, No. 25, page 30.

No. 48781.—Protest 975816 of E. Lerner & Sons, Inc. (Boston).

So-called rubber bubbles classified as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, are claimed dutiable as confectionery under paragraph 505 at 40 per cent. Opinion by Sullivan, G. A. On the authority of United States v. Andrews (12. Ct. Cust. Appls. —; T. D. 40268) the rubber bubbles in question were held dutiable as confectionery under paragraph 505.—*Treasury Decisions*, Volume 47, No. 10, page 28.

No. 48831.—Protest 29581—G of A. J. Bracher & Co. (New York).

HARD RUBBER DOUCHES.—Douches classified as manufactures of hard rubber at 35 per cent ad valorem under paragraph 1440, tariff act of 1922, are claimed dutiable as manufactures of india rubber at 25 per cent under paragraph 1439.

Opinion by McClelland, G. A. From the report of the Government analyst it was found that the douches are composed in chief value of black hard rubber and the classification under paragraph 1440 was therefore affirmed.—*Treasury Decisions*, Volume 47, No. 11, page 18.

No. 48853.—Protest 987603 of Koeller-Struss Co. (St. Louis).

RUBBER BALLOONS—TOYS.—Small rubber balloons classified as toys at 35 per cent ad valorem under paragraph 342, tariff act of 1913, are claimed dutiable as manufactures of india rubber at 10 or 15 per cent under paragraph 368.

Opinion by Sullivan, G. A. There was testimony that the balloons are used for advertising as well as toys. As the merchandise evidently was not intended or designed for the amusement of children only and is reasonably fitted for other purposes, such as the amusement of adults and for decorative and advertising purposes, it was held dutiable as manufacturers of rubber at 10 per cent under paragraph 368. Illfelder v. United States (1 Court Customs Appeals 109; T. D. 31115) cited.—*Treasury Decisions*, Volume 47, No. 11, page 22.

INTERNATIONAL PURCHASING AGENTS' CONVENTION

A convention and "informashow" will be held from May 25 to 28 inclusive at the Milwaukee Auditorium, Milwaukee, Wisconsin, by the National Association of Purchasing Agents. Committees are busy making preparations for this event, and all who plan attending should notify the general chairman, Walter H. Wenzel, of the Vilter Manufacturing Co., 935 Clinton street, Milwaukee. All companies also planning exhibits or desiring exhibition space should communicate with the convention executives for such space as is still available.

The Obituary Record

Son of Well-Known Rubber Man

Friends and business associates of Wilmer Dunbar learned with deep regret of the death on March 10 from pneumonia of his second son, Wilmer C. Dunbar, this occurring at the home of his parents on Tremont avenue, Greensburg, Pennsylvania. Young Mr. Dunbar was born in 1904 in Akron, Ohio, and was educated in the schools of Greensburg and at Lafayette College, Easton, where he became a member of the Sigma Chi fraternity. For the past two years he had been connected with the engineering department of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. Mr. Dunbar's many friends recognized him as possessing an attractive personality and high ideals.

Wilmer C. Dunbar

Factory Superintendent for Many Years

Elwyn Church Fish, for the past six years night superintendent of the Essex Rubber Co., Trenton, New Jersey, died at his home in Sherwood Park, Yonkers, New York, on January 31, 1925, after an illness of about seven weeks.

Born in Hope, Maine, September 12, 1861, he was educated in the public schools of Malden, Massachusetts, and began his business career with the Aetna Rubber Co., Jamaica Plain, Massachusetts. Later he was with the Cable Rubber Co. in the same suburb of Boston. In 1897 he accepted a position as foreman of the calender department of the National India Rubber Co., Bristol, Rhode Island, and in 1905 was appointed assistant superintendent, which position he held four years.

For a time thereafter he was superintendent of the Elkhart Rubber Works, Elkhart, Indiana, and was then connected with the Gutta Percha & Rubber Manufacturing Co., Brooklyn, New York. In 1913 he went to the Hodgman Rubber Co., Tuckahoe, New York, and during the World War was division superintendent of the druggists' sundries department.

Mr. Fish was a past master of Elliot Lodge, F. & A. M., of Jamaica Plain, Massachusetts, and later affiliated with St. Alban's Lodge, No. 6, of Bristol, Rhode Island. He was also a member of P. B. O. Elks, No. 425, Elkhart, Indiana.

He is survived by a wife and daughter. Burial was at Hope Grove Cemetery, Hope, Maine.

Death of W. E. Roberts

W. E. Roberts, plant superintendent of the Hodgman Rubber Co., and a director of the Paramount Rubber Consolidated, both in Tuckahoe, N. Y., died on March 24, 1925. Full obituary will appear in our next issue.

NATIONAL TIRE DEALERS' ANNUAL CONVENTION

The next annual convention of the National Tire Dealers' Association will be held in St. Louis, Missouri, November 17-19. The committee in charge of arrangements is the Associated Tire Dealers of St. Louis; chairman, S. L. Chorlins, 3908 Washington boulevard, St. Louis, Missouri. All tire dealers are respectfully requested to attend, whether they are members of the association or not.

News of the American Rubber Trade

Rubber Industry Outlook

THE rubber industry in its leading lines is operating at full capacity. In the tire division full schedules have been maintained since the beginning of the year, with no immediate prospect of reduction. The volume of business done in tires thus far this year exceeds that for the same period since 1920. Tire dealers' stocks in all sections are low and require prompt replenishment in view of early spring buying by the motoring public.

Several of the large tire plants in the Akron district have inaugurated increased manufacturing facilities and are operating on three eight-hour shifts. The output of this center has already risen to 120,000 tires daily and will soon exceed 125,000 as the increase of capacity becomes fully effective.

The opinion has been expressed by the head of one of the largest tire companies that 1925 will prove to be one of the best years in the history of the rubber and automobile industries in view of the growing demand for cars and tires.

Authorities in the rubber industry predict that a general advance in tire prices must come in the near future because of the increase in crude rubber and cotton prices. Purchases in these and other lines of manufacturing supplies are being made cautiously.

Akron has gained preeminence as the leading producing center of rubber footwear; however, at present manufacturers are less busy than in the winter months, gaiters, light rubbers, sport and tennis shoes predominating in the schedules.

The volume of business in the mechanical goods division continues in gratifying amount, with good prospects of maintaining the fine record of the first two months of the year. In the lesser branches of the rubber trade the volume of business offered is generally fair.

Financial

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Com.	$1.50	Mar. 16	Mar. 2
CanadianConsclidated Rub. Co.	Pfd.	1¾ % q.	Mar. 31	Mar. 24
Firestone Tire & Rubber Co...	6% Pfd.	1½ % q.	Apr. 15	Apr. 1
General Tire & Rubber Co....	Pfd.	1¾ % q.	Apr. 1	Mar. 20
Goodrich, B. F. Co.....	Pfd.	$1.75	Apr. 1	Mar. 16
Goodrich, B. F. Co.....	Pfd.	$1.75	July 1	June 15
Goodyear Tire & Rubber Co.	7% Cum. Pfd.	$1.75 q.	Apr. 15	Mar. 23
Goodyear Tire & Rubber Co.	Pr. Pfd.	$2.00 q.	Apr. 1	Mar. 20
Goodyear Tire & Rubber Co. of California	Pfd.	1¾ % q.	Apr. 1	Mar. 16
Goodyear Tire & Rubber Co. of California	Pfd. Acc.	1¾ %	Apr. 1	Mar. 16
Goodyear Tire & Rubber Co. of Canada	Ex.	1¾ %	Apr. 1	.....
Goodyear Tire & Rubber Co. of Canada	Pfd.	1¾ % q.	Apr. 1	.....
Miller Rubber Co.....	Com.	$1.50	Apr. 25	Apr. 10
Overman Cushion Tire Co..	Com.	1½ %	Apr. 20	Mar. 31
Overman Cushion Tire Co..	"X" Pfd.	1½ %	Apr. 20	Mar. 31
Seiberling Rubber Co.....	Pfd.	$2.00	Apr. 15	Apr. 5
Seiberling Rubber Co.....	Pfd.	$2.00	May 15	May 5
Seiberling Rubber Co.....	Pfd.	$2.00	June 15	June 5

New York Stock Exchange Quotations

March 23, 1925

	High	Low	Last
Ajax Rubber, com.....	11½	10½	10¾
Fisk Rubber, com.....	11⅛	10¾	10¾
Fisk Rubber, 1st pfd. (1).....	79½	79½	79½
Goodrich, B. F., Co., com.....	51	50	50½
Goodyear Tire & Rubber, pfd. (7) xd....	93⅞	93	93⅞
Kelly-Springfield Tire, com.....	14¾	14⅛	14⅛
Keystone Tire & Rubber, com.....	2⅛	2⅛	2⅛
Lee Rubber & Tire, com.....	12¼	12¼	12¼
United States Rubber, com.....	36⅜	35½	35¾
United States Rubber, 1st pfd. (8).....	95	94	94

Akron Rubber Stock Quotations

Quotations of March 20, supplied by Otis & Co., Cleveland, Ohio.

	Last Sale	Bid	Asked
Firestone com.	110	105	109½
Firestone 1st pfd.	100½	100	100⅜
Firestone 2nd pfd.	98	98⅛	99
General com.	240	..	240
General pfd.	101½	99¾	..
Goodrich com.	38½	..	..
Goodrich pfd.	95⅜	..	..
Goodyear com. V. T. C.	26½	26½	29
Goodyear pfd. V. T. C.	93⅞	..	..
Goodyear pr. pfd. V. T. C.	107¾	..	..
Miller com.	112	112	..
Miller pfd.	103	103	104
Star com.	8	..	..
Star pfd.	30	..	..
*Swinehart com.	10	..	..
Victor com.	⅜	½	1
Victor pfd.	..	..	..

*Unlisted securities.

Rubber Company Reports

The B. F. Goodrich Co.

For the year ended December 31, 1924, The B. F. Goodrich Co. reports net sales amounting to $109,817,685, as against $107,092,730 for the preceding year. Net profits, after depreciation, interest and deduction of a contingency reserve of $1,000,000, but before Federal taxes, were $8,822,504, as against $3,025,383 for the preceding year. All indebtedness to banks, amounting to $8,500,000 at the end of 1923, was entirely liquidated out of the profits of the year 1924.

The balance sheet shows total assets and liabilities of $84,885,891. Current assets were $43,986,314, and current liabilities, $3,412,856. Real estate and plant value is fixed at $30,514,130 after depreciation. Inventories of $19,921,765 compare with $24,390,647 at the end of 1923. Accounts and notes receivable amounted to $19,710,752, and cash, $4,037,454. Bills and accounts payable total $2,649,832. Surplus was $17,609,966 as compared with $11,106,949 the preceding year.

Goodyear Tire & Rubber Co.

For the year ended December 31, 1924, the Goodyear Tire & Rubber Co. reports sales, exclusive of subsidiary companies, amounting to $115,323,174, as against $106,026,109 for the preceding year. The total combined sales of the Akron, California and Canadian Goodyear companies and foreign branches were $138,777,719, as against $127,880,082 for the preceding year. Net profits of the Akron company before interest and other charges, but after allowance for Federal taxes, were $17,363,162, as against $12,720,127 for the preceding year. After interest and all charges the net balance carried to surplus was $12,161,540, against $6,507,245 the preceding year. The total surplus was $22,798,576, against $11,786,136 at the end of 1923.

The balance sheet shows total assets and liabilities of $164,125,995. Current assets were $59,647,342, and current liabilities, $6,785,767. Property accounts after depreciation are fixed at $49,065,268. Inventories amounted to $31,051,512; accounts and notes receivable, $11,954,709; cash, $11,494,120. Accounts payable totaled $5,309,525.

Of the bonds, debentures and prior preference stock aggregating $87,402,500 issued at the time of the company's reorganization on March 1, 1921, $24,152,500 has been retired through sinking funds and purchase. In addition the company held on December 31, 1924, $4,247,500 principal or par amount of debentures and prior preference stock, so that the total reduction from the peak debt totals $28,400,000.

The Fisk Rubber Co.

Net sales of the Fisk Rubber Co. for the fiscal year ended October 31, 1924, amounted to $52,946,531. Operating profits after depreciation, interest and other charges were $3,136,664, as against $2,583,613 for the ten months ended October 31, 1923. After allowance for Federal taxes, $2,736,664 was carried to surplus, making the total surplus $8,348,770. The company has no notes payable nor bank indebtedness. Unit sales increased approximately 10 per cent, while the value of such sales increased approximately 5 per cent. The balance sheet follows:

ASSETS

Capital assets		
Land, buildings, machinery and equipment..	$25,431,177.31	
Less: reserve for depreciation.....	5,891,239.27	
	$19,539,938.04	
Goodwill	1.00	$19,539,939.04
Investments		
Investments in and advances to No. 1767 Broadway Co., Inc. (Fisk Building).....	$1,551,980.51	
Miscellaneous investments	895,714.63	2,447,695.14
Current assets		
Inventories as certified by responsible officials.	$12,583,273.30	
Accounts receivable, less reserve.....	8,868,953.76	
Notes receivable	333,097.61	
Cash in banks, on hand and in transit.....	2,246,055.30	24,031,379.97
Deferred charges to operations including refinancing expenses of bond issue		1,435,952.59
		$47,454,966.74

LIABILITIES

Capital stock		
7% Cumulative first preferred		
Authorized—249,500 shares par $100.....	$24,950,000.00	
Issued—193,740 shares par $100.....	$19,374,000.00	
Less: 4,500 shares held for retirement....	450,000.00	
	$18,924,000.00	
Reserved for issue for a corresponding amount first preferred stock of the Federal Rubber Co., 275 shares.....	27,500.00	$18,951,500.00
Note—Dividends paid to May 1, 1921.		
7% Cumulative second preferred:		
Authorized—100,000 shares par $100.....	10,000,000.00	
Issued—10,514 shares par $100.....	1,051,400.00	
Reserved for issue for a corresponding amount of second preferred stock of the Federal Rubber Co., 276 shares.....	27,600.00	1,079,000.00
Note—Dividends paid to June 1, 1921.		
Management stock—authorized and issued...		15,000.00
Common:		
Authorized—1,250,000 shares no par value.		
Outstanding—796,882 shares		
(Of the above 796,882 shares, 50,000 are in escrow under option for $250,000).		7,543,145.01
		27,588,645.01
First mortgage 20-year 8% sinking fund gold bonds:		
Due September 1, 1941.....	10,000,000.00	
Less: bonds retired and held for retirement..	1,526,000.00	8,474,000.00
Current liabilities:		
Accounts payable	1,665,880.03	
Accrued bond interest.....	112,986.69	
Provision for Federal income tax.....	400,000.00	2,178,866.72
Reserves:		
For insurance liability assumed by company..	120,000.00	
For contingencies	744,684.10	864,684.10
Surplus, per statement annexed.....		8,348,770.91
		$47,454,966.74

The United States Rubber Co.

According to the thirty-third annual report of the United States Rubber Co. for the year ended December 31, 1924, sales were $172,214,353, a decrease of $14,047,028 as compared with 1923. This decrease was principally in waterproof footwear and partly in mechanical goods. Tire sales and profits showed a marked improvement.

Net income from operations, before interest on the funded indebtedness, but after all other charges including depreciation of plants, amounted to $13,783,905. Interest on funded indebtedness totaled $4,715,870, leaving net income of $9,068,035, after all charges.

Dividends on the preferred stock amounted to $5,227,518, leaving surplus for the year of $3,840,517, subject to Federal taxes estimated at $700,000. The consolidated surplus of December 31, 1924, amounted to $34,178,466, compared with $32,584,590 at the end of the preceding year.

During the year the company retired $947,000 of its funded indebtedness through the operation of sinking funds. Total funded indebtedness outstanding is reported as $84,078,800.

December 31, 1924, bank loans amounted to $31,490,000, having been reduced from $61,205,000, the high point, on November 20, 1920, entirely in the regular course of business, there having been no special financing during the period. For the purpose of replacing bank loans, and thus providing in a more permanent form for carrying a part of the company's inventories and other current assets, the directors authorized, on February 25, 1925, an issue of $30,000,000 of 6½ per cent serial gold notes, which have been sold to Kuhn, Loeb & Co. These serial notes mature in fifteen annual installments of $2,000,000 each from March 1, 1926, to March 1, 1940, in addition to which the company has the right, on March 1, 1930, or on any semi-annual interest date thereafter, to retire all of any one or more of the maturities then outstanding. This note issue does not increase the indebtedness of the company, but will place it in a better position to continue the liquidation of its indebtedness in the regular course of its operation.

The consolidated general balance sheet follows:

ASSETS

Cash	$11,540,604.66	
Accounts and notes receivable from customers (less adequate reserves for doubtful accounts)	43,182,212.17	
Accounts, notes and loans receivable, others (current)	2,395,128.65	
Total cash and receivables.....		$57,117,945.48
Inventories of finished goods.....	$40,140,290.70	
Inventories of materials and supplies, including goods in process.....	22,521,685.19	
Total inventories.....		62,661,975.89
Total current assets.....		$119,779,921.37
Plants, properties, and investments, including rubber plantations, less reserve for depreciation.....		183,819,346.91
Notes receivable of employes given for purchase of common stock and secured by such stock.....		6,521,935.77
Common stock of U. S. R. Co. held under service contracts and agreements		2,081,086.49
Securities owned, including common stock of U. S. R. Co. held by a subsidiary company.....		6,887,335.23
Prepaid and deferred assets.....		3,866,124.24
Total assets.....		$322,955,750.01

LIABILITIES, RESERVES AND CAPITAL

Bank loans	$31,490,000.00	
Accounts payable, including acceptances payable for importation of crude rubber.....	14,307,614.74	
Total current liabilities.....		$45,797,614.74
Funded indebtedness		84,078,800.00
Reserves for insurance.....	$2,268,157.92	
General reserves	2,237,635.82	
Reserve for dividend on preferred stock, payable January 31, 1925.....	1,302,200.00	
Total reserves		5,807,993.74
Capital stock—preferred..... $69,000,000.00		
Less amount held by subsidiary company 3,890,000.00	$65,110,000.00	
Capital stock—common.....	81,000,000.00	
Minority—Canadian Consolidated Rubber Co., Ltd., stock	273,600.00	
Total capital stock.....	$146,383,600.00	
Fixed surpluses—subsidiary companies.....	6,709,275.22	
Surplus (subject to final determination of Federal taxes for years subsequent to 1917).	34,178,466.31	
Total capital stock and surpluses.....		187,271,341.53
Total liabilities, reserves and capital.....		$322,955,750.01

The company had a contingent liability of $2,800,000 as endorser of a note of the Beacon Falls Rubber Shoe Co., which company is operated by the United States Rubber Co. under a management agreement entered into July 27, 1921.

The Miller Rubber Co.

For the year ended December 31, 1924, The Miller Rubber Co., Akron, Ohio, reports net earnings of $2,216,878.64, and a net addition to surplus of $1,531,311.36, thus increasing the company's surplus from $799,577.25 to $2,330,888.61. Current assets were $11,807,044.63 and current liabilities, including $340,832.00 for preferred dividends paid March 1, 1925, were $3,469,283.07. All deferred dividends on the preferred stock have been paid and a dividend of $1.50 per share was declared on the common stock for the first quarter of 1925.

During the past four years the company has expended $4,000,000 for plant improvements and cost-reducing projects, and with improved conditions should be able to continue a profitable business during 1925. There is now no bank indebtedness, while from a deficit of $1,290,604.30 on December 31, 1921, the organization has increased its surplus to $2,330,888.61.

Lee Rubber & Tire Corporation

The annual report of the Lee Rubber & Tire Corporation for the year ended December 31, 1924, shows net sales of $12,586,370.85 as compared with $9,390,397.22, an increase in 1924 over 1923 of $3,195,973.63. The net loss after depreciation and interest was $234,472.87, the surplus at the close of the year being $1,953,085.53. The report reflects the expense required to carry out the plan for unification of the Lee Tire & Rubber Co. and the Republic Rubber Co., which has already materially reduced operating costs.

The General Tire & Rubber Co.

Sales of the General Tire & Rubber Co., Akron, Ohio, for 1924 were $13,152,000, an increase of 50 per cent over last year, while net profits of $1,500,000 represented an increase of 25 per cent.

Balance Sheet, November 30, 1924

ASSETS

Current:			
Cash on hand and in bank		$478,025.28	
Liberty bonds and U. S. treasury certificates		300,116.80	
Compensation insurance fund		1,000.00	
Notes receivable		960,113.49	
Accounts receivable		1,485,040.78	
Accrued interest		8,025.12	
Inventory		1,317,899.65	
Total current assets			$4,550,221.12
Investment in other companies			9,505.40
Fixed:			
Real estate		30,700.00	
Buildings	$492,434.71		
Less reserve for depreciation	105,643.41	386,791.30	
Machinery	580,138.69		
Less reserve for depreciation	217,243.36	362,895.33	
Automobiles	56,209.70		
Less reserve for depreciation	31,264.40	24,945.30	
Furniture and fixtures	34,344.12		
Less reserve for depreciation	26,001.10	8,343.02	
Total fixed assets			813,674.95
Patents			1.00
Deferred:			
Inventory supplies		9,714.09	
Unexpired insurance		4,760.46	14,474.55
Total assets			5,387,877.02

LIABILITIES

Accounts payable and payroll		$348,416.46	
Excise tax accrued		16,600.90	365,017.36
Reserve for local taxes		50,000.00	
Reserve for branch taxes		12,000.00	
R's've for compensation insurance		24,455.48	
Reserve for burglary insurance		13,938.03	100,393.51
Capital stock—			
Preferred	$1,250,000.00		
Treasury	201,700.00	1,048,300.00	
Common	2,500,000.00		
Treasury	504,600.01	1,995,400.00	3,043,700.00
Surplus			1,878,766.15
Total liabilities including capital and surplus			5,387,877.02

Firestone Tire & Rubber Co.

Net sales of the Firestone Tire & Rubber Co. for the fiscal year ended October 31, 1924, amounted to $85,610,004, as compared with $77,583,149 for the preceding year. Net profits after depreciation, interest and other charges, but before Federal taxes, were $8,116,689. After providing for Federal taxes and preferred dividends the net profit applicable to the common stock was $17 per share. The company has no bank indebtedness, as compared with loans amounting to $31,355,000 on October 31, 1920. The balance sheet follows:

ASSETS

Cash on deposit in banks and on hand			$4,445,366.89
Receivables			
Customers' notes and acceptances	$151,447.26		
Customers' accounts, less allowance for discounts, etc.	8,404,810.28		
Controlled and allied companies	794,221.57		
Miscellaneous accounts and advances	132,682.20		
		9,483,161.31	
Inventories			
Finished and in process goods, raw material and supplies		13,831,492.95	
The Firestone Park Land Co.			
House and lot accounts receivable, unsold real estate, etc	$4,084,059.14		
Less: mortgages thereon, bonds outstanding, accrued interest	3,178,887.23		
		905,171.91	
Other accounts			
Due from officers and employes on account of purchase of common capital stock and advances, secured by 58,382 shares as collateral		5,012,946.15	
Investments			
Capital stock of foreign subsidiary companies	$3,658,500.00		
Other stocks and bonds	68,097.50		
		3,726,597.50	
Treasury stock			
Preferred and common shares purchased at cost		126,784.74	
Real estate, plants, etc.			
Land, buildings, machinery and equipment, less allowance for depreciation and amortization		20,853,856.78	
Deferred charges			
Prepaid insurance and taxes	$113,560.03		
Miscellaneous deferred items	345,678.08		
		459,238.11	
			$58,844,616.34

LIABILITIES

Accounts payable			
For purchases, payrolls, etc	$3,584,605.63		
Customers' credit balances	52,234.62		
		$3,636,840.25	
Accrued taxes			320,346.04
Reserve			
For estimated Federal taxes and general contingencies			1,300,000.00
Capital stock			
Preferred—6% cumulative			
Authorized ($10,000,000.00)			
Issued	$10,000,000.00		
Less: retired	1,548,800.00		
		$8,451,200.00	
Preferred—7% cumulative:			
Authorized ($40,000,000.00)			
Issued	$10,000,000.00		
Less: retired	1,087,200.00		
		8,912,800.00	
Common			
Authorized ($25,000,000.00)			
Issued	$3,750,000.00		
Less: treasury	212,290.00		
		3,537,710.00	
			20,901,710.00
Subsidiary company			
Preferred—7% cumulative of Firestone-Apsley Rubber Co.:			
Authorized ($1,000,000.00)			
Issued	$1,000,000.00		
Less: retired	29,600.00		
			970,400.00
Surplus			
General surplus	$30,247,530.02		
Insurance account surplus	1,467,790.03		
		31,715,320.05	
			$58,844,616.34

UNITED STATES MOTOR VEHICLE REGISTRATION IN 1924

According to compilations prepared by the Bureau of Public Roads of the United States Department of Agriculture, there were during the past year 17,591,981 motor cars and trucks registered in the United States, this figure representing an increase of 16.6 per cent over the year previous. The total included 15,371,570 private passenger cars, 2,131,332 motor trucks, and 89,079 taxis, buses, and cars for hire. Aside from this there were 153,925 motorcycles registered.

New Incorporations

Airubber Sales Corporation, March 17 (New York), $10,000. Incorporators: Fred'k Kraft, 802 West 181st street, New York City; M. Boyer, 15 Eleanor Place, Yonkers, N. Y., and L. Watson, 286 West 70th street, New York City. Principal office, 65 Moore street, New York, N. Y. Representing in the eastern part of the U. S. the Airubber Corporation of Chicago, Ill.

Ajax Tire Sales Corporation, March 6 (New York), 100 shares no par value. Incorporators: I. Skutch; W. C. Davidson and J. P. H. Rieper, all of 22 Exchange Place, New York City. Principal office, Manhattan. To carry on a tire business.

American Tire & Rubber Co., Inc., The, January 9 (Ohio), $1,000. Incorporators: J. T. Johnson; E. L. Schmock; Ray C. Myers; Will S. Campbell and C. T. Morledge, all of Akron, Ohio. Principal office, Akron, Ohio. To act as a selling corporation for The American Tire & Rubber Co.

Art Webb Tire Corporation, March 17 (New York), $5,000. Incorporators: K. B. Somerville, 201 Rich street; I. M. Kennedy, 120 Oxford street and N. M. Webb, 610 East Willow street, all of Syracuse, New York. Principal office, Syracuse, N. Y. To carry on a tire business.

Auburn Tire Sales Co., of New York, Inc., February 18 (New York), $10,000. Incorporators: L. B. Rowe, B. H. Bartlett and J. J. Costello, all of 250 West 57th street, New York City. Principal office, Manhattan. To carry on a tire business.

Louis W. Dumont & Co., Inc., March 17 (New York), $5,000. Incorporators: Louis W. Dumont and Patrick A. Murphy, both of 132 Front street, New York City, and R. D. Dumont, 251 West 87th street, New York City. Principal office, Manhattan. Crude rubber brokers.

Hubmark Rubber Co., Inc., March 3 (New York), $1,000. Incorporators: H. B. Hubbard, 5 Nassau Blvd., Garden City, N. Y.; S. J. Rametta, 230 Ocean Parkway, Brooklyn, N. Y., and S. J. Schur, 1071 St. Nicholas avenue, New York City. Principal office, Utica, N. Y. To manufacture footwear and other rubber goods.

Lindsay Asbestos Incorporated, March 10 (New York), 2,000 shares no par value. Incorporators: L. Lindsay, 999 East Main street; A. B. Curran and L. D. Mahoney, both of 1232 Granite Building, all of Rochester, N. Y. Principal office, Rochester, N. Y. To manufacture asbestos and rubber goods.

Long Island Rubber Corporation, March 2 (New York), $1,000. Incorporators: W. H. Lilly, 425 Center street, Long Beach, N. Y.; Harry Lilly, 101 West 93rd street, New York City, and M. J. Phelan, 320 West 96th street, New York City. Principal office, Long Beach, N. Y. To manufacture tires.

Moss Wheel & Tire Corp., March 7 (New York), $25,000. T. O. Watrous, president, 206 Vestal avenue; A. B. Chadwick, general manager and treasurer, 170 Court street, and Geo. Eisenhart, secretary, all of Binghamton, N. Y. Principal office, 85 and 87 Carroll street, Binghamton, N. Y. To deal in wheels, tires, batteries, etc.

Silver King Rubber Co., February 25 (Delaware), 3,000 shares without nominal or par value. Incorporators: F. R. Hansel, Philadelphia, Pa.; E. M. MacFarland, Camden, N. J., and J. Vernon Pimm, Philadelphia, Pa. Principal office, with the Corporation Guarantee and Trust Co., Ford Bldg., Wilmington, Delaware. To manufacture and deal in tires and all kinds of rubber goods.

Traveler Mfg. Co., February 18 (Delaware), 200,000 shares of Class A, preferred stock, par value $5 and 5,000 shares Class B, common stock without nominal or par value. Incorporators: Henry McKeown; George H. Reed and M. M. Toner, all of Wilmington, Delaware. Principal office, with Sylvester D. Townsend, Jr., 925 Market street, Wilmington, Delaware. To carry on a business of manufacturing and dealing in tires.

U. S. A. Jiffy Fountain Pen Co., March 5 (Delaware), $50,000, par value $100. Incorporators: E. E. Craig, J. M. Townsend and A. L. Raughley, all of Dover, Delaware. Principal office, with the United States Corporation Co., Dover, Delaware. To manufacture fountain pens and the several parts thereof.

The Rubber Trade in the East and South

In most lines production is at capacity output. This is notably so in the case of tire production, particularly in balloon tires, which are constantly being developed in every structural feature and wearing quality.

The popularity of closed car models brought a serious problem to the makers of automobile topping, for which the demand has been reduced to but 20 per cent of its recent proportions, due to the fact that a closed car requires but 3 yards of topping where the touring car required 12 to 15 yards. In consequence, topping makers turned first to the production of plain and fabric and rubber stock for reducing girdles for the corset trade and with the passing of that fad to sheet rubber for the cutting up trade for aprons, baby pants, bathing caps, etc.

The brisk demand by dealers for rubber footwear notable during January and February abated considerably in March and the factories are now on reduced schedules.

Rubber tile flooring has been taken on by many plants and competition has seriously reduced the price of the goods.

Heel plant capacity is largely in excess of requirements. At least four large leather shoe plants are already making their own requirements of rubber heels. This has emphasized competition for the remainder of the trade. Two other influences are operative to the same end; namely, more automobile riding and less walking reduces the wear on heels and decreases the need for heel replacement, and also the many cheap shoes made induce working people with good wages to forego shoe repair bills and purchase new.

The insulated wire plants are busy on old orders and looking ahead for new, which are slow in coming in. In telephone wires and lamp cord, production is heavy.

Rubber sundries plants are generally on part time except for sheet gum, sheetings and other specialties. Mechanical goods plants are busy on their seasonal lines and have fair business on general lines.

Eastern and Southern Notes

Paul Elbogen & Co., Inc., 24-26 Stone street, New York, N. Y., crude rubber dealer, announces that Clarence H. Low has been elected vice-president and treasurer of that concern. Mr. Low is well known in the industry, having been secretary of the United States Rubber Reclaiming Co. and later a director of that organization, and also of the Madison Tire & Rubber Co. He retired from the rubber business several years ago and since then has devoted his attention to other business interests. He will be cordially received by the rubber trade, in which he has hosts of friends.

Huxley, Willis & Co., 39 Cortlandt street, New York, N. Y., is a new organization, two of whose executives, Edward H. Huxley and Raymond S. Willis, were formerly officials of the United States Rubber Co. The new concern will handle exports and imports for American manufacturers.

J. P. Ripley has been appointed manager of the New York district for The Fisk Rubber Co., 250 West 57th street, New York, N. Y., succeeding Benjamin Smith. Mr. Ripley has served the Fisk organization in various capacities since 1909, having been manager of the Baltimore district and later the central district, with headquarters in Chicago.

A new organization, capitalized at $250,000, will soon open its offices in New York City under the name of the Allyn Corporation, and will handle Self-Seal Leak-Proof inner tubes, as manufactured by the H. H. Allyn Rubber Corporation, Norwich, Connecticut. Executives of the new concern include Fred Patten, president; Louis M. Eidam, vice-president; and Sidney L. Parker, treasurer.

Following the termination of the copartnership of Sorenson & Nielson, John S. Sorenson will continue to serve foreign and domestic clients in the export and import trade under the name of Sorenson & Co., Inc., 104 Pearl street, New York, N. Y.

Keller & Christensen, Inc., crude rubber brokers, announce the removal of their offices on March 1 to the Whitehall Building, Room 2742, 17 Battery Place, New York, N. Y.

David Moffat, formerly with Balfour, Williamson & Co., is now associated with J. S. Rodenbough & Co., crude rubber brokers, with offices at 25 Beaver street, New York, N. Y.

Increasing business has resulted in a removal of the New York City branch of The Mohawk Rubber Co., Akron, Ohio, to more commodious quarters at 245 West 55th street.

A separate division to be known as the engineering research department and headed by Victor Wichum has been recently organized at the plant of the C. J. Tagliabue Manufacturing Co., 18-88 Thirty-third street, Brooklyn, New York. Development work on indicating, recording and controlling instruments and on oil-testing instruments, etc., will be in charge of Frank Bast, R. M. Wilhelm, Daniel C. Day, and William C. Begeebing.

S. G. Belaief has been appointed sales manager in charge of the tire division of C. Kenyon Co., 57th street and First avenue, Brooklyn, New York. H. L. Kenyon, president of the organization, has recently returned from a successful business trip through the western states.

E. H. Kidder, general sales manager of the Dunlop Tire & Rubber Co., Buffalo, New York, during his southern trip arranged for a new wholesale distribution point in New Orleans, Louisiana. The spring dating business of the Dunlop company is over four times greater than it was a year ago.

The Goodyear Rubber Sundries, Inc., New Haven, Connecticut, manufacturer of rubber specialties, has purchased a building adjoining its present factory, thus securing an additional floor space of 60,000 square feet. The company is now moving into this building, and is planning to increase its present output. James A. Murray is president.

A case unique in the history of Connecticut receiverships in that creditors have been paid in full, has involved both the Kelley Tire & Rubber Co. and its successor, the Martin Tire & Rubber Co., of New Haven, Connecticut. Albert F. Barclay, one of the receivers, has liquidated these two concerns, sold the stock and a large amount of equipment and finally the land, buildings and machinery to the Armstrong Rubber Co., Inc., of Garfield, New Jersey. By this means sufficient funds were realized to pay in full all preferred creditors as well as all general creditors, while a balance remains for division among the stockholders.

With new equipment and a factory addition, the Carlisle Tire & Rubber Co., Carlisle, Pennsylvania, will be in a position, about April 15, to double its present output of inner tubes, a product in which the organization specializes. The present operating schedule of 24 hours a day will be continued during the next six or eight months. Charles S. Moomy is president and treasurer.

The first business year of the DeLion Tire & Rubber Corporation, Baltimore, Maryland, has been most successful. Sales connections increased 1,000 per cent, and several production improvements were completed, while the factory output is greater than at any time in the history of the organization. Two full shifts are now being maintained. E. E. Harrington is vice-president.

The Lawson Rubber & Manufacturing Co., Inc., 1329 Plowman avenue, Dallas, Texas, manufactures blow-out shoes and various tire accessories and supplies reclaimers with dykes or rubber scrap. The organization is considering installing a reclaimed rubber plant. Executives include: J. R. Lawson, president; E. Robert Lawson, vice-president; and B. H. Abbott, secretary.

Extensive alterations at the plant of the Milstead Manufacturing Co., Conyers, Georgia, specializing in hose duck and tire fabrics, will include a 10,000 square feet addition to the carding and spinning rooms; another enlargement providing 7,500 square feet for additional looms; a new testing department; a new turbine to replace the former water wheels; and the complete electrification of the entire plant. Thomas J. Callaway is vice-president and general manager.

George A. Gomperts is now in charge of the Lambert Trublpruf Tire Co., Inc., Atlanta, Georgia, an organization which handles goods manufactured by the Lambert Tire & Rubber Co., Akron, Ohio.

The Riverside Manufacturing Co., Moultrie, Georgia, specializing in the manufacture of lettered tire covers, has steadily increased its sales during the last three years, and has now equipped a thoroughly modern plant for the production of these goods. W. J. Vereen is president and treasurer.

George C. Kloss, for several years associated successively with the Republic and Gillette organizations, has been appointed sales manager of the Carolina Rubber Co., Salisbury, North Carolina.

The Rubber Trade in New Jersey

There has been a decided improvement in all lines of manufactured rubber goods during the past month and the New Jersey manufacturers are optimistic over the future and are looking for a good spring and summer season.

Orders for tires and tubes have increased at all the Trenton plants, one concern reporting that it is far behind in filling orders, even after increasing working hours. Another tire manufacturing concern has started up again after having been closed for several weeks. At the hard rubber plants it was said that the output in all lines was increasing. The Trenton mechanical goods factories are also running to capacity, and there has been an increase in the production of rubber cloth. Tire manufacturers are looking for an increase in prices because of the advance in the cost of crude rubber and fabrics.

Brighton Mills Elects Executives

The following executives were elected at the annual meeting of the stockholders of Brighton Mills, Passaic, New Jersey, an organization specializing in tire fabrics: William L. Lyall, chairman of the board of directors; Henry J. Haigh, president and treasurer; and Thomas M. Gardner, secretary and manager of sales department. Mr. Lyall has for many years been president of the organization, while Mr. Haigh has for the past two years been treasurer. According to official reports, the Brighton organization is considering a plan for moving part of the plant to the South.

Sale of Bergougnan Authorized

Sale of the assets of the Bergougnan Rubber Co., Trenton, New Jersey, at an upward price of $250,000 free and clear of all liens was ordered by Judge William N. Runyon in the United States District Court at Newark on the application of counsel for Charles E. Stokes, receiver for the bankrupt firm. The sale is expected to take place some time in April.

The plant is not to be sold for less than $250,000 and will either be disposed of in its entirety or in two parcels, the real estate and the mechanical equipment.

New Jersey Notes

The plant of the Spartan Rubber Co., Yardville, New Jersey, has been sold to a Trenton syndicate headed by Michael Gilinsky, for $40,250. The plant was erected several years ago by the Zee Zee Rubber Co., which went into the hands of a receiver and was purchased by Newman Brothers, New York, who changed the name to the Spartan Rubber Co.

The Pierce-Roberts Rubber Co., Trenton, New Jersey, manufacturer of druggists' sundries, has just closed a successful business year. The concern has some good sized orders on hand, and H. W. Roberts, president of the company, says the prospects are good for a busy summer.

While the Essex Rubber Co., Trenton, New Jersey, is busy again, business during the past month slowed up a little. Officials are anticipating a busy summer in soles and heels.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, has appointed R. J. Biery to cover the territory in and around Shamokin, Scranton and Allentown, Pennsylvania. Mr. Biery will continue to live in Philadelphia and will handle Globe tires and tubes.

The Joseph Stokes Rubber Co., manufacturer of hard rubber goods exclusively, reports improved conditions in all the departments, with bright prospects for the coming summer.

The Combination Rubber Co., Trenton, New Jersey, is again in active production and is operating to capacity, with good sized tickets on balloon tires and heavy duty tires. The concern has begun the manufacture of a new flap tread tire which is expected to give much longer wear. The company is far behind in orders

and will turn out more tires and tubes this year than any year in its history.

The Thermoid Rubber Co., Trenton, New Jersey, reports that business has improved and all departments are running to capacity. The company has been exceptionally busy since the manufacture of tires and tubes was discontinued some months ago.

Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, reports a large increase in orders. It is now several weeks behind supplying tires and tubes for salesmen. The company will shortly increase prices.

Ajax Rubber Co., Trenton, New Jersey, announces that business conditions are normal, and that prices have not changed.

The Essex Rubber Co., Trenton, New Jersey, has completed a new receiving and shipping warehouse costing approximately $50,000. The building is 60 by 200 feet, and two stories high.

Horace B. Tobin, president of the Woven Steel Hose & Rubber Co., Trenton, New Jersey, has been reelected President of the Mercer Hospital Association.

Mr. and Mrs. Harry L. Boyer sailed recently for a tour of Spain, Gibraltar, Algiers, Naples, Constantinople, Paris, London and other points of interest. Mr. Boyer is general manager of the Joseph Stokes Rubber Co., Trenton, New Jersey.

The Trenton Tire Dealers' Association has disbanded after an existence of more than a year. The association was unable to get all the Trenton tire dealers to affiliate, and therefore surrendered the charter. Frederick Petry, Jr., head of the Petry Motors Co., was president.

Business has increased considerably at the plant of Whitehead Brothers Rubber Company, Trenton, New Jersey. This well-known company specializes in hose, belting and packing.

Harold M. Bates has opened up an establishment at 407 South Broad street, Trenton, N. J., where he is handling Hood tires and tubes.

De Blois Tire & Rubber Co. has opened a new store at 116 North Willow street, Trenton, N. J., where Ajax products are handled exclusively.

Thomas H. Thropp, treasurer of the John E. Thropp & Sons Co., Trenton, New Jersey, manufacturer of rubber machinery, divides his interests into three parts—business, public service and recreation. His playground is at Barnegat Bay, where he fishes and hunts week ends, but every Monday morning he is back at his desk. Mr. Thropp was sheriff of Mercer county when he was but 29 years old, and is one of the "Big Four" politically in New Jersey.

The Michelin Tire Co., Milltown, New Jersey, announced that it had made its three-millionth balloon tire after little more than a year of production. The complete success of such a large number of tires, says President J. Hauvette-Michelin, indicates that there can now be no further doubt that balloon tires give greater satisfaction than previous types. An advance of approximately 7 per cent in the price of Michelin tubes was announced effective March 16.

WOMEN IN OHIO RUBBER INDUSTRY

The 1920 census figures show that during 1920 there were 6,705 women employed in the rubber factories of Ohio, a survey of the industry including about one-third of this number. The median week's earnings of these 2,098 women were $17.25, the median of the 568 full-time workers being $18.55. The rubber industry has the distinction of being one of the two Ohio industries included in the general survey in which no adult woman working a full week earned less than $10.

The Rubber Trade in Rhode Island

Business during March was a continuance of conditions similar to those that have pertained among the rubber manufacturing concerns of this state for some time past, although there appears to be reasonable promise of some improvement in the early future. All the footwear plants are still working on part-time schedules, but the production so far exceeds the demand that a few days' work replenishes any depletions that may be made in stocks.

The tire plants are slightly more active, while those concerns manufacturing druggists' sundries, novelties and specialty goods report a more stable schedule and a larger showing on orders. But even these are not what they should be at the period, considering the long interval of curtailment, greater or less, according to the different plants. A few plants in the state engaged in making some exclusive specialty are reported to be operating on full time and capacity schedules, some even running overtime and some with day and night shifts.

National on Part Time

Operations at the National India Rubber Co.'s plant at Bristol continue along the lines of curtailment that have prevailed for a number of months. In fact, the present period of part time schedules is the longest ever experienced by this company.

About the middle of the past month the wire division of the Bristol plant began a temporary operating schedule of four days per week, the continuance of which is very indefinite, depending entirely upon future business conditions. Some 375 employes in this department are affected.

There is no immediate change in sight in connection with the shoe division, which is at present employing only about 2,100 persons, after having been operating on a shortened time card and production for more than a year. The present total number of persons employed at the National plant is approximately 2,500, whereas during prosperous times nearly twice that number are on the payroll. Lack of orders resultant in a great measure from adverse weather conditions, it is claimed, is responsible for the situation.

Rhode Island Notes

The Carolina Co., which makes headlinings for the Ford Motor Co. of Detroit, about the middle of the month shipped two complete carloads of their product, one to Detroit and the other to the New Jersey plant of the concern. The mill at Richmond is at present operating on a full time schedule on its day card and the present indications are that the company will be forced eventually to return to day and night shifts due to accumulated orders.

The Columbia Narrow Fabric Co., which now operates two factory branches in addition to the main plant at Shannock Center, manufacturing silk elastic webbing, is now running all its places on a full time schedule, with a good business demand and many weeks' orders ahead. The silk mill, which is separate from the main plant, has been operating steadily since 1921, while the Peace Dale plant of the concern, which was very recently taken over by the Columbia Narrow Fabric Co., and is given over entirely to the manufacture of flat elastic braid, is running on a capacity card both night and day.

Charles Tirrell, of Warren, who has been employed in the traffic department of the National India Rubber Co. at Bristol for the past ten years, has resigned so as to accept a position in the bookkeeping department of the Rhode Island Hospital Trust Co.

J. D. Anderson, vice-president and manager of the Chicopee division of the Fisk Rubber Co., has been promoted to general manager of production at all six divisional plants of the corporation, according to an announcement that was recently made by President H. T. Dunn. Mr. Anderson, it is stated, will have charge of the production at the four textile plants operated by the concern, located at Pawtucket and Westerly in this State, at New Bedford, Massachussetts, and at Jewett City, Connecticut, as well

as the two plants at Chicopee Falls, Massachusetts, and at Cudahy, Wisconsin.

Anthony Novielle has filed a statement at the city clerk's office that he is the sole owner of The Service Tire Sales Co., 453 Atwells avenue, Providence.

The Centerdale Volunteer Fire Company of North Providence is in the market for 500 feet of double-jacketed fire hose.

The Trinity Tire Co., 338 Broad street, Providence, is owned by A. Martin, of 1 Vine street, according to information filed by him at the city clerk's office.

The Attleboro City Council makes an estimate of $1,000 for new hose in its annual budget now in preparation.

The city of Cranston is considering the purchase of 1,000 feet of hose for each of two of its volunteer fire companies.

The Rubber Trade in Massachusetts

Massachusetts rubber plants are busier than they have been for a long time. Most of them are operating on full time schedules, and all in Malden and Chelsea are running on an overtime basis.

A quickening demand in the shoe and leather industry in response to Easter buying has developed, following the seasonal dullness of February. Rubber heel and sole output has felt the effect of this, likewise that of cement and shoe findings, and the seasonal production of canvas shoes for sports wear is well under way in rubber footwear plants.

Production and sale of rubber tires continue at record levels, thanks to a remarkably open winter and early spring, and prospects are that this year's volume of trade will break all records. Balloon tires are beginning to be a Massachusetts as well as an Ohio product.

Mechanical rubber goods plants are busy with ample orders for standard goods, railway equipment and seasonal spring and summer lines such as garden hose, jar rings, etc. Druggists' sundries are still in good demand, and this is an active season for makers of weatherproof clothing. Insulated wire and flooring production is now large in response to steadily increasing building activities.

Boston Automobile Show

Another unqualified success was registered at the Boston Automobile show held at Mechanics Building, March 7 to 14 inclusive. Attendance showed no great decrease despite the discontinuance this year of all trade tickets, and sales of cars are estimated at $1,500,000, proving that New England continues to be one of the best motor vehicle markets.

Balloon tires were again an outstanding feature, practically every car shown including them as regular equipment. None of the tire manufacturers exhibited directly but tires of various makes were displayed by local distributers and accessory dealers. Lambert Trublpruf tires were shown by the J. W. Coyle Corporation; Holmes Jacks balloon tires by the Garage & Auto Supply Co.; Hewett tires, tubes and accessories, Green & Sweet Co.; Yale tires and Allyn Self-Seal inner tubes, Hope Tire Corporation.

Solving Balloon Tire Changeover Problems

Many motorists have hesitated in changing to balloon tires, due to the expense of scrapping existing tires capable of further mileage and the cost of the smaller wheels required. Several Boston tire dealers have devised various ways to reduce the cost of changeovers practically to the cost of the new tires themselves.

The Lee Tire & Rubber Co. furnishes wooden wheels free of charge with Lee balloon tires in sets of five. With Lee balloon type tires inner tubes are furnished without extra cost.

The A-1 Tire Co., 296 Columbus avenue, and the Royal Tire Co., 300 Columbus avenue, are taking used tires in part payment for new tires, both high-pressure and balloons. Used tires in good condition are also sold at attractive prices.

New England Tire & Rubber Co. Personnel Changes

Following a recent meeting of the New England Tire & Rubber Co., Holyoke, Massachusetts, changes in executive personnel were announced: A. T. Hopkins remains president; L. A. Laporte becomes general manager and treasurer; John Kearns will continue as production manager; while Fred Osborne, formerly associated with the Lee Tire & Rubber Co., is now adjuster at the New England company's plant.

With the factory now in full operation, the officials plan to continue the manufacture of chainless cord tires and Holyoke cord tires, and to enter upon the manufacture of balloon tires. Business last year was most satisfactory, and an increase in production is contemplated for the present year.

Chain of Tire Stores Growing

The Central Automobile Tire Co., 111 to 119 Staniford street, Boston, Massachusetts, is one of the largest organizations of its kind in the world. It has a chain of fourteen stores stretching out over New England as far north as Portland, Maine, and as far south as New Haven, Connecticut. Besides its retail field, a large amount of business is done with dealers through its wholesale department.

Organized by Charles M. Rudginsky in 1900, the business was incorporated in 1906 under the laws of Massachusetts. The officers are as follows: Louis Rudginsky, president; Harry Rudginsky, vice-president; Charles M. Rudginsky, treasurer; Eugene M. Schwartzenberg, secretary; Samuel M. Rachlin, director of sales and advertising.

Massachusetts Notes

Honorable L. D. Apsley and Mrs. Apsley spent part of the winter in Panama and later on in Jamaica. They are expected back in Hudson the latter part of April.

E. C. Newcomb, manager of the Boston branch of the General Tire & Rubber Co., anticipates a much better year than in 1924, when his company's sales increased 50 per cent despite limited factory facilities. Special attention is being given to the tire requirements of motor buses, as the General Cord tire is particularly adapted to this type of service.

Tire companies specializing in heavy duty motorbus tires are jubilant over the fact that Governor Fuller has signed the Brown bill, introduced by the legislative counsel of the Boston & Maine Railroad, authorizing railroad companies to carry freight or passengers by motor vehicles provided the action is approved by the Department of Public Utilities. This is expected greatly to increase motorbus traffic in Massachusetts.

A new factory addition, containing about 25,000 square feet, has been erected for the Archer Rubber Co., Milford, Massachusetts, which is extending present production of rubber clothing, hospital sheeting, rubber tubing and the rubberizing of fabrics.

E. D. Manley, manager of the Boston branch of the Firestone Tire & Rubber Co., believes that the year 1925 will mark a long step toward universal adoption of balloon tires by motorists. Spring dating orders for balloons have exceeded his most optimistic expectations.

Herbert, Stretch & Kendrick, Brockton, Massachusetts, will soon engage in the manufacture of elastic and non-elastic narrow fabrics.

E. A. McCoy, manager of the Boston branch of the Kelly-Springfield Tire Co., has recently returned from a managers' conference at the factory in Cumberland, Maryland.

Robert M. Bowen will succeed Arthur F. Townsend as president of Bemis Associates, Inc., Watertown. Because of the pressure of business, Mr. Townsend, who is also president of the Manhattan

Rubber Manufacturing Co., Passaic, New Jersey, is resigning some of his duties with the Bemis organization, but will remain a member of its board of directors. Organized in 1910 for the purpose of producing gutta percha goods, the Bemis company is at present one of the largest organizations engaged in the manufacture of splicing tissue for paper mills.

F. M. Bell, manager of the Boston branch of the Mason Tire & Rubber Co., states that Mason Cord tire sales are making rapid progress in New England, over 100 new dealers having been added to the already long list this year.

Over forty New England distributers of the Dayton Rubber Manufacturing Co. recently attended a special convention and banquet given in their honor at the Copley-Plaza Hotel, Boston. C. F. Buttrick, Boston branch manager, acted as presiding officer, and three of the Dayton company officials, A. L. Freedlander, vice-president and factory manager; G. W. Spahr, general sales manager, and E. B. Self, advertising manager, were among the speakers.

The Linscott Supply Co., 574 Commonwealth avenue, Boston, is now distributer for Thermoid hydraulic compressed brake lining.

Godfrey L. Cabot, dealer in carbon black, Boston, is president of the National Aeronautic Association, which asserts that "America is very distinctly and emphatically first in the air." For three years it has been seeking enactment of federal legislation placing the control of commercial aeronautics under a bureau of civil aeronautics in the Department of Commerce.

The Atlas Automobile Tire Co., Charles I. Fiegen, president, 60 Eliot street, Boston, is exclusive factory distributer for Racine tires and tubes with a wide dealer distribution in large cities and towns throughout New England.

The Rubber Trade in Ohio

Production of automobile tires and allied products mounted to new high levels in rubber factories of the Ohio district during March, in line with the general business revival all over the country. Approximately 120,000 tires a day are now being manufactured in Akron alone, representing a gain of 20 per cent over production levels in effect at the close of 1924. A corresponding gain has been noted in rubber footwear and mechanical goods lines.

Many Akron rubber factories are building additions and installing new machinery, which will further enlarge their capacity. Among these are the Goodyear Tire & Rubber Co., which is completing a new five-story machine shop building; the Firestone Tire & Rubber Co., installing new tire building machinery, designed to increase the plant's output by 25 per cent in the near future; The B. F. Goodrich Co., starting a new footwear warehouse and office buildings; the Miller Rubber Co., now building a $200,000 addition to the company's millroom factory building. The General Tire & Rubber Co. and the India Tire & Rubber Co., as well as several smaller companies, have just completed additions to their plants.

Effective March 15, Goodyear increased its tire production schedules to 33,000 casings and 45,000 tubes a day. More than 1,000 men have been added to the company's payrolls within the past month to take care of the increased output. In addition, the Akron plant is manufacturing large quantities of mechanical goods, such as rubber belting, hose, rubber flooring, and rubber soles and heels. The present output of rubber heels is said to be the largest of any rubber company in the world.

Firestone is now making close to 30,000 tires a day and 34,000 tubes. The new improved tire building machinery being installed will eventually boost production to 40,000 tires a day, it is reported. Large shipments of balloon tires, to be used as original equipment on new automobiles, are being sent to the Ford Motor Car Co.

Approximately 25,000 tires and 30,000 tubes are being turned out at the Goodrich plant. The tire business so far has been entirely satisfactory, according to officials, but Goodrich has made its biggest gain in the rubber footwear and mechanical goods lines. The largest footwear sales in the history of the company were recorded in the past two months.

Miller, the next largest tire producer in the district, is manufacturing upwards of 10,000 tires a day, and the company reports a big increase in orders from dealers for replacement business. Manufacturing capacity of the plant will be enlarged considerably by completion of an addition now under way, to cost in the neighborhood of $200,000.

Equally as good business is reported by the majority of the smaller companies. Both General and India, which do no original equipment business with the motor car manufacturers, but distribute all their products through jobbers and retail dealers, report an unusually large volume of orders received since the first of the year. Sales managers of these companies state that no new dealers, to speak of, are being signed up at present, all the factories' output being distributed through regular channels.

Ohio Notes

C. E. Wagner, now manager of the export department of The Miller Rubber Co., Akron, Ohio, had seventeen years' experience in export work and international trade before becoming connected with the Miller organization. He has also traveled extensively, and is familiar with several languages.

C. E. Wagner

R. D. McDowell is now president of The India Machine & Rubber Mold Co., Annadale avenue, Akron, Ohio, an organization specializing in the production of rubber machinery, cores and molds. D. N. Rosen, now vice-president, was compelled to retire from the presidency because of the pressure of other business.

At the annual stockholders' meeting of The Star Rubber Co., Inc., Akron, Ohio, the reports showed a gain in sales for 1924 of 15 per cent, as compared with the year previous. Figures were: for 1924, $1,854,586; 1923, $1,617,046; and 1922, $1,513,362.

The following officers were also elected: L. H. Firey, president; R. L. Robinson and W. A. Humphreys, vice-presidents; J. W. Dessecker, secretary; R. G. Shirk, treasurer; J. A. Christie, factory manager, and R. S. Saalfield, sales manager.

Sales this year by The Giant Tire & Rubber Co., Findlay, Ohio, show a decided increase over those of the corresponding period last year. Additional equipment is now being installed which will bring the daily output up to 1,200 or 1,300 tires a day. C. E. Hart is president.

The board of directors of The Republic Rubber Co., Youngstown, Ohio, has been reduced from seven to five members. The company is now considering plans for increasing its factory output of tires and tubes.

The following executives were elected at the annual meeting of the directors of The Falls Rubber Co., Cuyahoga Falls, Ohio: M. J. O'Donnell, president and treasurer; C. F. Bailey, first vice-president; J. O. King, second vice-president; G. D. Kratz, third vice-president; O. C. Nelson, secretary; and W. P. Kline, assistant secretary and treasurer. Sales during 1924 were 54 per cent larger than for the previous year, this increase being in value only, while the percentage increase in units was considerably greater. The company manufactures Falls tires, Evergreen tubes, and Neverpinch rim covers.

Frank Zech, who has had wide experience in the crude rubber business and has spent three years in Singapore attending to rubber interests, is now associated with J. W. Herron & Co., crude rubber brokers of Akron, Ohio.

Frank Zech

The H. W. French Co., Inc., 347 Madison avenue, New York, N. Y., crude rubber broker, has moved its Akron offices to 1101 Akron Savings and Loan Building, Akron, Ohio. At this new location Harry C. Jones is in charge.

The Barr Rubber Products Co., Sandusky, Ohio, specializing in dipped and molded rubber goods, recently held its annual meeting and officers and directors were re-elected. At this meeting a 25 per cent stock dividend was declared. The company also announces an increase in its capitalization to $200,000. Nelt Barr is president.

Contemplating an increase in production to over 2,000 tires daily, The Pharis Tire & Rubber Co., Newark, Ohio, has recently purchased and had moved to its factory the machinery, including calender, mills, etc., of the dismantled Rotary Tire & Rubber Co., of Zanesville, Ohio. A. R. Lindorf is president of the Pharis organization.

Satisfactory sales during the past year are reported by The Pioneer Rubber Co., Willard, Ohio, while business for 1925 is proving better than for several years past. Shipments for January and February were 30 per cent better than for the same period last year. Executives recently elected include: T. W. Beelman, president and treasurer; J. C. Gibson, vice-president and general manager, and R. K. Williams, secretary.

The Fidelity Tire & Rubber Co., Massillon, Ohio, manufactures Ford size tires, fabric and standard cords, and balloon type casings. For the past two years the organization has been operating with three eight-hour shifts daily, the production having been above 600 tires a day. C. E. Pumphrey is sales manager.

The Lima Cord Sole & Heel Co., Lima, Ohio, will move into a new plant where production facilities will be increased. Modern equipment is also being installed, and Gro-Cord soles, with a specific pattern for each style of shoe, will be produced on a larger scale than formerly.

The factory now under construction contains 25,000 square feet of floor space. In addition to the main factory there are two separate units, a modern steam plant and a rubber mixing plant. There is also a testing laboratory, where experiments are conducted under the direction of J. E. Grosjean for developing new ways of meeting shoe sole requirements. By April 1 the plant will be in operation. J. E. Grosjean is president and T. Nicar is general manager.

Plant of the Lima Cord Sole & Heel Co.

The Regal Rubber Co., West Riverview, Dayton, Ohio, has found it necessary to add new equipment, on account of increasing sales. Established a little over a year ago, the company is headed by: C. R. Keiser as president, with C. C. Marston as treasurer.

Production is to be increased both at the Kent and Bedford plants maintained by The Mason Tire & Rubber Co., Kent, Ohio, and prospects for the present year are most encouraging. C. H. Williams is vice-president.

Frank P. Corbett, who for some years has been manager of the branch maintained by the Lee Tire & Rubber Co. at Columbus, Ohio, has now gone into business for himself under the name of the Frank P. Corbett Co.

Production is well under way at the plant of The Marathon Rubber Co., Cuyahoga Falls, Ohio, a company now reorganized as a subsidiary of the Goodyear organization. The manufacture of Marathon tires will be continued, and the output of casings this spring will be approximately 600 a day. In addition to tires the Marathon factory will turn out miscellaneous goods, among them the Marathon trouser belts. Officials of the new organization include C. C. Osmun, president, and C. E. Falor, vice-president and factory manager. The latter was previously connected with the Goodyear organization, which he has served in various capacities during the past twenty years. R. W. Sohl and F. B. Speakman are engineers at the Marathon plant in charge respectively of development and compounds.

C. C. OSMUN, PRESIDENT

C. E. FALOR, VICE-PRESIDENT AND FACTORY MANAGER

Officials of the Marathon Rubber Co., Inc.

The directors of the Victor Rubber Co., Springfield, Ohio, have elected H. H. Durr president and R. F. White secretary and treasurer. Mr. Durr was formerly president of the Victor organization from 1904 to 1921. Mr. White, who for the past three years has been auditor, has been connected with the Victor company since 1917. Additional equipment for larger production is now being installed, while new sizes of tires are also to be manufactured.

Plans for expansion are under way at the factory of The Oak Rubber Co., Ravenna, Ohio, where toy balloons are made a specialty. Business during the past year has been most encouraging. At the company's annual meeting the following officers were reelected: John C. Goodman, president; John W. Shira, vice-president and general manager; and Paul E. Collette, secretary and treasurer of the concern.

Although the production of tires has not yet been resumed by The American Tire Corporation, Niles, Ohio, the organization is now turning out approximately 600 inner tubes a day, while prospects for the future are most promising. J. E. Hughes is assistant treasurer.

The Rubber Trade in the Midwest

Activities of Latex Tire Co.

At the recent annual meeting of the stockholders of The Latex Tire Co., Fond du Lac, Wisconsin, Orlano J. Koll was elected president; E. J. Shaw was appointed vice-president; and other officers were reelected. The company's sales continue to show steady improvement, the demand for Latex casings being particularly good in the Southwest and on the Pacific Coast. A shipment of tires has now been sent to British East Africa, and the company is planning to extend its business in foreign fields.

Midwest Notes

David Russell, of D. Russell & Co., 108 West Lake street, Chicago, Illinois, is now the representative in Chicago and the West of The Schwarzwaelder Co., Richmond and Pickwick streets, Philadelphia, Pennsylvania, an organization making a specialty of rubberizing and waterproofing fabrics. Mr. Russell was born in Chicago in 1870, and secured some of his business training in Chicago commercial schools. Since 1903 he has headed a selling agency which features rubberized fabrics in special combinations for the jobbing and manufacturing trade.

David Russell

At the recent annual meeting of the stockholders of the Servus Rubber Co., Rock Island, Illinois, all the executives of the organization were reelected. In about a month the three-story addition to the factory will be completed, the enlargement affording a manufacturing capacity of 12,000 pairs of footwear a day.

On February 1, 1925, The Cooper Tire & Battery Co., 2028 South Calhoun street, Fort Wayne, Indiana, was established to handle goods manufactured by The Cooper Corporation, Cincinnati, Ohio. The last-mentioned organization maintains factories at Findlay and Madisonville, Ohio.

New and larger branch headquarters have been secured by The Mohawk Rubber Co., Akron, Ohio, for its Chicago division, now at 1524 Southwestern avenue, Chicago, Illinois.

C. R. Calligan has been appointed manager of the branch at Minneapolis, Minnesota, maintained by The Miller Rubber Co., Akron, Ohio. Mr. Calligan has for more than eight years served his organization in various capacities, and is thoroughly conversant with the Minneapolis territory.

The General Tire Sales Co., Illinois and North streets, Indianapolis, Indiana, has leased a tract of land at Delaware and Pratt streets, Indianapolis, where a modern service station is now being constructed. The company handles General cord and balloon casings.

The Trego Radio Manufacturing Co., Kansas City, Missouri, which occupies part of the building maintained by the newly organized Rubberstone Manufacturing Co., was established two years ago by Mrs. Nellie E. Trego. Beginning in a small way with the manufacture of radio receiving sets, the company soon became prosperous, and now employs 125 persons. A. J. Stephens who heads the Trego organization, is also president of the Rubberstone Manufacturing Co.; Mrs. Trego is treasurer; C. F. Stephens is secretary; H. M. Stephens is vice-president and general manager; and S. Cheifetz is sales manager.

H. J. Hoyt, for the past nineteen years associated in various capacities with the Morgan & Wright plant of the United States Rubber Co., Detroit, Michigan, has severed his connection with that organization. Mr. Wright is taking a vacation before announcing his future plans.

The Westminster Chemical Co., 531 South Peoria street, Chicago, Illinois, has recently completed an addition to its present plant and has also installed new and specially designed machinery for the manufacture of a complete line of rubber substitutes, factice, etc.

The Rubber Trade on the Pacific Coast

A more cheerful tone was noted in the rubber trade on the Pacific Coast during the past month, as compared with February. Tire dealers, convinced that rumors of tire price cuts were misleading, have actively resumed purchasing, anticipating a lively spring and summer business. Local manufacturers and the branches of eastern and midwestern factories are now much encouraged at the prospect. Mail order houses report that tire sales are considerably ahead of the same period in 1924. Foreign trade is being sought actively by tire makers in view of steadily improving economic conditions abroad, especially in the Orient. Prospects in Mexico afford manufacturers much encouragement.

Steady progress is being made by the Pacific Coast rubber manufacturers in marketing their products east of the Rockies, in the mid-continent oil fields, where belting, hose, valves, and other mechanicals made on the Coast are being sold. Producers insist that goods are not being sold cheaper than eastern products, but that sales are based upon quality. Oil men are disregarding stock brands and demanding goods made to suit conditions under which they operate.

The building trades are looking up and mechanical goods dealers are optimistic. Footwear orders are being booked up to April 1 for fall delivery, and total considerably more than a year ago. Heavy rains in the Northwest have helped much. In tire repair materials there is improvement, due to assurances given buyers that tire price reductions are quite improbable. Already vulcanizers are doing a fair trade in retreading balloons, but few are yet provided with suitable equipment. That balloons are going stronger than ever is attested by the larger dealers, some of whom predict that 75 per cent of the tire sales on the Coast in 1925 will be balloons. Sales in March were computed at 10 per cent over high pressure tires.

Pacific Coast Notes

Directors of the Goodyear Tire & Rubber Co. of California, Los Angeles, have declared as payable April 1 the regular 1¾ per cent dividend on the preferred stock and a like payment for the account of dividends in arrears. This is the second dividend paid on the arrearages, the first having been paid in January. A quarterly 1¾ per cent dividend has also been declared by the Goodyear Textile Mills.

The Thermoid Rubber Co., Trenton, New Jersey, reports a considerable increase in sales of brake lining and other products on the Coast, most of the business being now handled by the company's own branches.

The Goodyear Rubber Co., 539 Mission street, San Francisco, California, is one of the oldest concerns of its kind on the Coast. It was established in 1872, and manufactures a varied line of dredger sleeves, concentrator belts, and mechanical goods generally. R. H. Pease is president and treasurer, J. A. Shepard is vice-president, C. F. Runyon is secretary and Howard Middleton is manager.

J. A. MacMillan, president of the Dayton Rubber Co., Dayton, Ohio, and F. M. Hoblitt, vice-president of the Ajax Rubber Co., New York, N. Y., in charge of sales and advertising, have been surveying trade conditions on the Coast.

The Western Rubber & Tire Co., 128½ S. Beaudry avenue, Los Angeles, California, has taken over the New Standard Rubber Co., which does a retreading business exclusively for the trade and manufactures all its tread material, as well as selling the latter to repair men.

The Columbia Tire Corporation, Kenton, Oregon, is very busy, and the president, Robert A. Wurzburg, is confident that the volume of sales this year will be double that of 1924. The number of dealers was increased 120 per cent in 1924. Distribution extends from Canada to Mexico and from the Coast to Salt Lake City. W. L. McNerney is merchandising manager; J. F. Cullen, plant engineer, and R. H. Brown, factory superintendent.

The Coast Tire & Rubber Co., 50th avenue and East 12th street, Oakland, California, has been entirely reorganized. J. C. Hughes is president and general manager, Louis S. Budo vice-president and assistant general manager, Roy G. Thompson assistant general manager and manager of production, and Earl H. Russell secretary-treasurer. It is believed that the company's plant will be running at capacity production in a short time.

Makers and dealers are anticipating a lively trade in rubber insulated wire. Business generally has improved and electric power companies on the Coast plan to expend during 1925 $250,000,000 for new work and extensions.

The Dudley Tire Mold & Manufacturing Co., 561 Pacific boulevard, Los Angeles, California, is planning a new factory in order to double its output of tire molds for which there is a strong demand.

Douglas Radford, president of the West American Rubber Co., 400 N. Avenue 19, Los Angeles, California, has returned from a business trip in the South and Midwest and reports business unusually good.

The Westinghouse Commercial Investment Co., a subsidiary of the big Westinghouse concern in Pittsburgh, was organized to help the company's customers and distributers in financing sales of electrical equipment on the partial payment plan. J. J. Gibson, vice-president, spent considerable time during March looking over the Coast territory.

The Banner Rubber Co., a new organization maintaining plant and offices at 3553-63 Wazee street, Denver, Colorado, began operations about March 1, the factory output to include floor tiling, rubber matting, soles, heels, and various lines of mechanical rubber goods. Executives include: Hans Christensen, president; I. V. Snell, vice-president, and Webb Waldron, secretary and treasurer.

An aggressive sales campaign on the Pacific Coast was foreshadowed at a recent conference in Akron of the entire sales force of the Goodyear Tire & Rubber Co. of California. The delegation was headed by E. L. Falls, head of the advertising department in the Los Angeles factory. The latter is very busy, the daily production now averaging 5,000 tubes and over 4,500 casings, with the balloon percentage steadily increasing.

The Rubber Trade in Canada

Canadian Notes

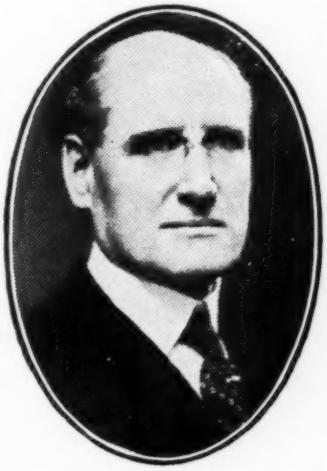
Gutta Percha & Rubber, Limited, 47 Yonge street, Toronto, Canada, has for some time past been maintaining branch warehouses in St. John, New Brunswick, and in Halifax, Nova Scotia. On January 23 the company's warehouse at Lethbridge, Alberta, was destroyed by fire, with total loss of stock. The loss was however fully covered by insurance. Charles N. Candee is president and managing director.

A special service to manufacturers for increasing production efficiency is being offered by Wilson & Fessenden, a new firm of production engineers with offices at 83 King street West, Kitchener, Ontario. Mr. Wilson has successively held positions with Goodyear, both at Akron and in Canada, with the Canadian Consolidated Rubber Co. and with the Dominion Tire Factory. Mr. Fessenden was formerly associated with the Merchants Rubber Factory and was in charge of plans for work at that plant.

Fifteen warehouses are being maintained in the principal cities of Canada by The Kaufman Rubber Co., Limited, Kitchener, Ontario, these divisions all being under the direct management of the head office. An additional warehouse has now been opened at Moose Jaw, Saskatchewan, in order more thoroughly to cover the southern portion of the province. The Kaufman company specializes in the manufacture of rubber footwear.

President of the Canadian Dunlop Company

Edmond Baird Ryckman, who was recently elected president of the Dunlop Tire & Rubber Goods Co., Limited, Toronto, Canada, in succession to the late Warren Y. Soper, is no stranger to the rubber industry. It was he who, in 1898, secured the Dunlop rights for all America, and the following year organized the Dunlop Tire Co., the firm name being changed to its present form in 1905. For twenty-five years he has occupied the position of vice-president.



Edmond Baird Ryckman

He was born April 15, 1866, at Huntington, Quebec, Canada, the son of the Rev. Edward Bradshaw Ryckman, M.A., D.D,. and his wife Emmaline Edmond Baird, both Canadian. His father was of United Empire Loyalist stock and a distinguished clergyman of the Methodist church in Canada.

Mr. Ryckman was educated at Brantford Collegiate Institute and Toronto University, also Osgoode Hall, Toronto, B.A., M.A., LL.B., K.C. He was graduated with honors, winning the Prince of Wales gold medal for general proficiency, a gold medal in classics on his university graduation, and the gold medal of the Law Society on his graduation in law. In 1895 he married Mabel Louise, daughter of the late Edward Gurney, of Toronto. They have had four children, Edward Gurney, Lieutenant Royal Flying Corps, killed in action in France; Rosamond; Edmond Baird; and Barbara Frances.

A business lawyer by profession, Mr. Ryckman is also actively identified with several important manufacturing concerns in Canada. In addition to being president of the Dunlop Tire & Rubber Goods Co., he is a director of the Gurney Foundry Co., Limited, of the International Business Machines Co., Limited, and of the Russell Motor Co., Limited.

Like his father, a Methodist, he is a prominent Conservative in politics, and in 1894 was the Conservative candidate for the Ontario Legislature in East York. In 1908 he was appointed a King's Counsel, and at the general Dominion elections in 1921 was elected a member of the House of Commons of Canada as the representative for East Toronto, the district in which the Dunlop factories are located. He had twice declined nominations as Conservative candidate in the Toronto constituency where he resides at 44 Walmer Road.

His clubs include the Toronto; Albany; National; Hunt; Royal Canadian Yacht, Toronto; Manhattan, New York; Caledon Mt. Trout; and the Rideau, Ottawa.

The Rubber Trade in the Far East

Malaya

Some Restriction Aspects

An outstanding characteristic of some local rubber men is their extreme sensitiveness to fluctuations in the price of rubber. When there is a slight drop in prices they are depressed, and when prices rise a few cents they are happy.

What a contrast to that portion of the local population represented by the Associated Chinese Chambers of Commerce which consistently fights restriction with weapons to suit altered conditions. Thus when prices dropped last year they voted that the Stevenson plan had failed and should be abolished. But when rubber recovered and recently reached the highest price in years, this organization argued that restriction had served its purpose by raising prices and was no longer needed. In fact, a petition was drawn up to the latter effect which it was voted to send to the Colonial Secretary.

Which of these two groups succeed best in ruffling the dispositions of the remaining group, the confirmed restrictionists, it is hard to say. It is necessary to cheer them up with the facts that stocks are decreasing despite Dutch native rubber; that new uses for rubber are being found daily; that a shortage is more probable than a surplus; and that by getting excited they are bearing the market.

And the anti-restrictionists have always to be shown up as selfish perverters of fact and to be emphatically told that no tactics of theirs will abolish restriction before those qualified to judge decide upon such action.

Malayan Imports and Exports

During 1924 the total amount of rubber exported from Malaya was 259,704 tons, value $264,943,000. Of this amount 107,419 tons, value $75,196,283 was of foreign origin. The Netherlands East Indies supplied 93,095 tons, of which 12,289 tons were dry and 80,806 tons were wet; Sarawak and British North Borneo 8,047 tons of dry and 327 tons of wet rubber; Indo-China, Siam, Burma and others, 3,460 tons dry and 2,490 tons wet. In all only 23,796 tons consisted of dry rubber, while the remaining 83,623 tons were wet.

A comparison of export figures for the last three years shows clearly the enormous growth in the Dutch shipments on the one hand and the steady decrease of net Malayan shipments on the other: 1922, total exports 249,674 tons, foreign shipments 35,550 tons; 1923, total exports 255,309 tons, foreign 70,432 tons; 1924, total exports 259,704 tons, foreign 107,419 tons. Despite the fact that imports trebled in 1924 as against 1922, the increase in total exports as compared with 1922 is only 10,000 tons.

During the first month of 1925 Malaya's total exports were 19,183.25 tons against 23,848.45 tons the previous year. Native rubber imports were 10,131.63 tons against 8,667 tons in January, 1925. Of the 1925 imports 2,554.84 tons consisted of dry crêpe and dry smoked sheet.

Planting Company Reports

From a dozen company reports read as they appeared in local papers the impression gained was that as a whole producers are well satisfied with the working of restriction. Some openly acknowledge that but for the measure disaster to themselves would have been unavoidable.

In a good many cases the results of the work over the past business year were not up to the standard of 1923, partly owing to the sudden set-back in 1924 and partly to the revision of assessments which in many cases reduced the allotted crop causing not only a decrease in income from sales but an increase in the cost of production. In spite of this the tendency is toward optimism.

In many reports the statistical position is analyzed and the conclusion seems to be that consumption has at last caught up with production and that 1925 should prove to be a very happy one for the producer. It seems to be taken for granted that the output from all sources outside of Malaya and Ceylon will not exceed 240,000 tons, while the amounts from the restriction area, with quarterly releases of 5 to 10 per cent is put at not more than 235,000 tons.

Of the twelve reports under review, seven recorded forward contracts for 1925 totaling 264 tons at prices ranging from 1*s* 3*d* to 1*s* 5¼*d* per pound. Of the other five one showed a contract for delivery to an American firm of most of its output in the form of latex, while in one report, that of Pelepah Valley Estates Ltd., selling forward in times of difficulty was pronounced inadvisable.

Incidentally it is interesting to note that the managing director of the above firm recently visited the East and stated among other things that he had found that "American controlled estates were not admirable managers of natives." He was full of praise for the restriction scheme and apparently quite convinced that the Dutch were tapping as in the days when rubber was 10*s* per pound; consequently he felt that Dutch competition in future years need not cause much fear.

It is a curious fact that only one report, that of the Sembilan Estates Co. Limited, makes mention of work in bud-grafting. This enterprise has a budded area of 270 acres. Apparently this method of propagating rubber has not yet "caught on" very well in Malaya. The possibilities of sole crêpe appear to interest producers to a greater extent. Two companies, the Singapore Pará and the Lunas Rubber Estates, have decided to install machinery for making this material.

Malayan Notes

The exportable percentage for the new quarter, beginning February, 1925, has been fixed at 55 per cent. The London quotation averaged a fraction below 1*s* 6*d* for the past quarter and so those calculating on a release of 60 per cent were disappointed.

The Governor in Council grants exemption from provisions of Section 3 of the Rubber Dealers Ordinance in respect of purchase: by private persons, of rubber in reasonable quantities for the legitimate use of themselves and their family; by boat-makers and vendors of soles, of sole crêpe rubber, in reasonable quantities, for the purpose of making soles, etc.; and by industrial concerns, of crêpe rubber built up in layers for lining sluice boxes, launders.

The prize competition for the best rubber footwear suitable for the laboring classes of the East, organized by the Rubber Propaganda committee closed January 31, 1925. It seems that a large number of entries has been received. G. E. Shaw, Secretary for Agriculture, J. A. Archibald, R. D. Ramasamy, Datoh Lee Kong Lam and John Hands, have been invited to constitute the board of judges.

It is learned that tests have been made in Perak in regard to laying planks of bridges on a bed of scrap rubber. This means is said to have succeeded very well in reducing jolting and vibration.

Indo-China

The death is announced of G. Vernet, well-known Indo-China scientist and director of the Laboratoire de Technologie Agricole à l'Institut Scientifique, on December 10, 1924.

Ceylon

At a meeting of Ceylonese Rubber Growers (non-European) a resolution to the effect that rubber restriction was vicious in principle, inimical to the true interests of the industry and unjust to the rubber growers and that the Rubber Restriction Ordinance should be repealed was passed. An amendment stating that the time for abolition was inopportune and that the report of the committee appointed to consider the question of rubber restriction be awaited was defeated by 15 votes against 7.

Bud Grafting

Ceylon appears to be rather indifferent as far as bud-grafting is concerned. Some slight interest was shown in the matter a year or so ago, but of late practically nothing is heard of work in this connection.

During a discussion of this subject at a recent meeting of the Estates Products Committee, T. Petch, Acting Director of Agriculture, warned his hearers that they must be prepared sooner or later to employ new methods of planting if they were not to be left behind by the other rubber centers in the East. He considered the results obtained in Sumatra to be very promising and recommended that local planters should mark out and keep under observation their best yielders so as not to be unprepared when the time came to adopt new planting methods. He cited the case of Cinchona planting as a warning. Although Ceylon was advised to select better strains, nothing was done about the matter until after years it was suddenly found that Java had meantime worked on the problem and had finally succeeded in commanding the quinine market.

Netherlands East Indies

Statistical Errors Due to Dirty Native Rubber

In the *Indische Culturen* (*Teysmannia*), January 15, 1925, Dr. O. de Vries calls attention to statistical errors caused by not taking into proper consideration the amounts of moisture and dirt present in native rubber from different parts of the Dutch colonies.

Figures obtained from two leading factories in Singapore early in 1924 and covering some 60,000 piculs of native rubber showed losses in washing ranging from 9 per cent for Bengkalis (Sumatra) to 36 for Djambi. The average loss after washing was over 27 per cent.

Dr. Pekelharing collected a number of samples in Djambi, Sumatra, and shipped them to Buitenzorg, Java. Upon arrival there it was found that the rubber had lost 11 per cent in weight during transit and after being kept in the original cases for fourteen days longer it had lost a further 25 per cent. By the time this rubber had been converted into crêpe, it had lost an average of 52 per cent in weight. One sample showed a loss of almost 60 per cent.

It thus appears that the stuff as it leaves Djambi really contains only 48 per cent of rubber. Djambi has the worst reputation for wet and dirty rubber; Palembang and Bandjermassin are also known as wet districts, while Pontianak (Borneo) generally exports a fairly dry, clean article. However, the greatest quantity of rubber comes from the wet districts, so that it would be correct to say that the actual exports of native rubber are one-third less than the gross weight mentioned in the returns.

Production Per Acre Figures Corrected

Dr. De Vries calls special attention to an error appearing in *The World's Rubber Position* of October, 1924, in which the actual production per acre during 1923 is given as 264 pounds for Malaya, 270 pounds for Ceylon and 374 pounds for the Netherlands East Indies. The amount for the Dutch colonies was arrived at by dividing the total output for 1923, 125,294 tons (where the necessary correction for moisture in native rubber was made), which comprised both estate and native rubber, by 750,000 acres, the estimated estate acreage in production. That is, the total exports, estate plus native rubber, were divided by the acreage for the estates only.

The actual figure should be 290 pounds per acre, found by dividing the estate output of 81,694 tons by the estate acreage in production, 620,000 acres.

Forward Contracts and Recent Floods

Reports concerning floods in Sumatra last year showed that considerable damage had been done to rubber estates, both as far as production and the plantations themselves were concerned. It now appears, however, that in some cases the consequences of this damage will be more far-reaching than was originally thought. For there are numbers of estates which, owing to the large areas flooded that could not be tapped, find that their actual crop is considerably below their estimate, so that all those that had made big forward contracts for December are in a difficult position, especially as, outside of the effects of the floods, the December crops are disappointing anyway as a consequence of recent heavy rains.

The worst of it is that December is generally the last month of a contract year and that as a rule new contracts begin in January, so that several firms will have to buy rubber in the open market with more or less considerable loss to themselves in order to fulfill their obligations. Most of the forward sales last year were made at prices of about 1.50 guilders per kilo ($0.60 per 2.2 pounds), whereas new purchases probably will have to be made at not less than 2 guilders per kilo ($0.80 per 2.2 pounds).

There is a possibility that the heavy rains during January will result in disappointing crops for that month, too, and that the difficulties will be repeated.

Apropos of troubles in connection with forward contracts, it is learned that a number of Chinese rubber dealers are having a hard time due to the fact that they had made heavy forward sales at comparatively low rates last year and, as they generally do not carry very large stocks, will have to buy in the open market at the very much higher prices prevailing now.

Netherlands Planting Notes

Dr. O. de Vries and R. Riebl publish in the *Archief voor de Rubbercultuur*, December, 1924, results of investigations of the factors responsible for stickiness of crêpes, and yellow color of crêpe. With regard to the former, no definite cause could be traced; only one thing was clear, that thin crêpe often showed stickiness, while crêpe of over 1½ mm. thickness did not.

The yellow color of crêpe is chiefly caused by yellow latex. Drying with heat induced a yellow color, whereas drying without heat gave a white crêpe.

In the same number of the above publication, W. Spoon discusses an examination of Ceylon blanket crêpe. A series of seventeen samples of first quality Ceylon blanket crêpe was investigated, the inner qualities of which proved to be good in all cases. The rate of cure of this rubber was slower than for Dutch rubber, which is ascribed to the fact that the plantations in Ceylon are older than in the Dutch colonies. Characteristic differences were found in blanket made of air-dried crêpe and in that made of artificially dried crêpe, particularly as far as rate of cure and viscosity were concerned. Re-examination of a number of the oldest samples showed that after storing in Buitenzorg for 2½ years the inner qualities had not altered to any marked extent, though after five years a certain amount of deterioration was found.

A prospectus of the forthcoming book by Dr. A. Steinmann, of the West Java Experiment Station, on the pests and diseases of Hevea *brasiliensis* in the Netherlands East Indies, has just been received. According to this, the book will contain 26 plates in color, besides 90 illustrations collected at the end of the volume. All diseases, symptoms, and treatments are discussed and full bibliography provided. Before the manuscript went to press it was sent to the different experiment stations in Java and Sumatra, where valuable notes were added.

The Rubber Trade in Europe

Great Britain

FAVORABLE conditions continue in the rubber industry, with America buying more crude rubber and definite indications of considerably increased consumption by the Continent. It has been pointed out, however, that while production continues more or less regularly throughout the year, consumption does not take the same even course, and that even if world requirements should during the present year reach 500,000 tons, it does not necessarily follow that the world will consume every month 42,000 tons. In other words, there may be periods when no lack of supply is felt, alternating with others when there is pressing demand and pronounced inflation due to actual shortage.

Forward Rubber Selling Inimical to the Industry?

In calling attention to the fact that America absorbs about 75 per cent of the crude rubber produced the *Financial Times* states:

"Whether or not our chief customers lay deep plans to secure rubber at the lowest possible price is a secondary consideration to the necessity for a system of selling that will protect producers from exploitation and will insure a fair price for their commodity. Competitive selling in a market which relies upon one large customer is obviously very bad business. Victimization of the sellers, already divided among themselves, must follow. It is here that the rubber producing industry is peculiarly vulnerable, and the lack of system and understanding among the growers means anything from *3d* to *6d* per pound less for their product than if the producers met the market with a united front.

Unfortunately for the whole industry this weakness is aggravated by forward selling. Not content with competing with each other to sell spot rubber, attempts are made to steal a march upon their fellow producers by selling forward several months or even a year ahead. Nothing could possibly suit the transatlantic consumer better and nothing could be more prejudicial to the market and the producing industry. The manufacturer naturally soon contracted a habit of buying forward and selling spot rubber. In this way he kept the current price down and fulfilled his future requirements on more favorable terms, and was at the same time always protected against wide price fluctuation. It is only quite recently that this practice, by overindulgence, has defeated itself, and latterly we have seen spot rubber at a premium over that for future delivery. Forward selling, unless controlled by an organization representing and acting for producers, must inevitably prove inimical to the industry in general.

Crude Rubber Shortage Predicted

It is believed by many that the American rubber manufacturing industry is sailing too close to the wind, while rumors of a possible shortage of crude rubber are being more and more openly expressed. Such a contingency seems not improbable when it is noted that on March 24 stocks in London were reduced 18,934 tons, a supply equal to less than two weeks' world's consumption, as compared with similar stocks a year ago of 55,286 tons. One publication reviewing the present condition of affairs in an editorial headed "Rubber Fireworks" quotes an estimate for the current year of minimum excess of consumption over new production at 22,000 tons, and further states that if the Dutch East Indies fail to provide an extra 31,000 tons, the excess of consumption over production may amount to from 30,000 to 40,000 tons.

In an editorial "Can a Crisis Be Avoided?" the *Rubber Age* (London) says in part: "Thanks entirely to the opposition the Stevenson scheme encountered, stocks have been reduced almost to vanishing point. And so far as can be judged, production in 1925 will be some 25,000 to 30,000 tons short of the world's requirements. It is therefore not merely a question of the further reduction of stocks, it is a question of no stocks, and failure to supply to meet demand."

The following seems apparently to be a reasonable summing-up of the case:

All the evidence tends to confirm the conviction that the hand-to-mouth buying policy of rubber consumers has been prolonged to such a dangerous extent that a situation has now been reached which is full of explosive possibilities. Under the restriction scheme the only thing that can bring out more rubber is a higher price. It is clear that more rubber is needed, and the logical inference is that, either through timely recognition by consumers of the coming stringency or by the same being forced upon their notice later on by the actual facts, such an advance in price must occur as will provide the quantities needed.

British Tire Trade During 1924

According to official statistics secured by the British Rubber Tire Manufacturers' Association, Limited, the production of English tire factories showed a large increase for the year 1924 as compared with 1923, while imports correspondingly lessened. In 1923, 397,130 automobile casings were exported from the United Kingdom; in 1924 there was a gain of over 28 per cent, the total exports numbering 550,263. It is interesting to note that during the same period United States exports of such tires declined 8 per cent from 1,362,000 in 1923 to 1,250,000 in 1924. In most European markets British tires showed a gain for 1924 as compared with the year previous, this being particularly true in the Netherlands, Spain, Greece, Denmark, Sweden and Norway. In Mexico, Cuba, and the British West Indies there was also an improvement in the tire trade of the United Kingdom, as was also the case with the British possessions in Africa.

Total exports from Great Britain of pneumatic casings reached a value for the entire year 1924 of £1,988,377; inner tubes, £400,293; and solid tires, £351,545. Imports for the year were thus estimated: pneumatic casings, £2,317,869; inner tubes, £406,897; and solid tires, £1,396,363. Corresponding export values for the year 1923 were: pneumatic casings, £1,581,670; inner tubes, £282,479; and solid tires, £316,458. Import values for 1923 included: pneumatic casings, £3,033,983; inner tubes, 367,543; and solid tires, £313,787.

Census of British Rubber Industry

A census taken in June, 1921, in connection with the industries of England and Wales only, and now being published, gives the following figures for the rubber industry: Manufacture of rubber boots and shoes, 1,332 persons employed—391 males and 941 females; manufacture of tires and other rubber goods, 44,967 persons employed—29,130 males and 15,837 females. Rubber workers connected with the tailoring industry and numbering 563 should also be included in the total. In the manufacture of rubber boots and shoes 84 per cent of the total were engaged in "production, maintenance and repair"; in the manufacture of tires, etc., about 66 per cent. In the latter branch warehousemen, packers, clerical workers, etc., accounted for about 20 per cent.

In the entire industry six great divisions were represented: Lancashire, 16,215 operatives; Birmingham district, 11,501 operatives; Greater London, 10,119; West Riding, 378; Northeast Coast, 161; and South Wales, 148.

British Exports of Rubber Boots and Shoes

The rubber footwear trade throughout the chief rubber manufacturing countries of the world appears to have been particularly good during the past year, if statistics are to be believed. Advances during 1924 as compared with 1923 are reported for this branch of the industry by the United States, Canada and France, while British exports of rubber boots and shoes increased from 223,376 dozen pairs valued at £362,920 in 1923 to 259,409 dozen pairs valued at £411,920 for 1924. Although Great Britain imported during 1924 large amounts of such goods, particularly from the United States, exports also increased, the leading purchasers of British footwear being: Australia, 31,110 dozen

pairs; the Netherlands, 26,311 dozen pairs; Norway, 21,321 dozen pairs; New Zealand, 14,927 dozen pairs; Denmark, 11,795 dozen pairs; and Turkey, 9,990 dozen pairs.

British Notes

A new organization, capitalized at £6,000, and to be known as Mouldensite, Limited, is also affiliated with the Condensite Company of America. The concern will manufacture Mouldensite phenol-formaldehyde products, plastic phenol condensation products, rubber composition, etc. The new company succeeds the Mouldensite Manufacturing Co., Darley Dale, Derby.

Under the name of Woodite, Limited, a company has been formed to succeed the Woodite Co., Mitcham Common, London, S.W., the new organization, capitalized at £5,000, to continue the manufacture of rubber goods.

On February 24, the death occurred of J. T. Goudie, director of the Leyland and Birmingham Rubber Co., Limited. Mr. Goudie was widely experienced in the rubber industry, as was his father before him. The son had been chairman of the India Rubber Manufacturers' Association from 1915 to 1919, and had only recently been appointed permanent chairman of the mechanical section of that body.

Harry Cunningham, formerly secretary of the South American Cable Co., Limited, and later connected with the India-Rubber and Gutta-Percha Works Co., Limited, died February 28 at the age of 64. He was compelled two years ago to resign his duties with the last-mentioned organization because of continued ill health.

Germany

Statistics of Germany's rubber trade during 1924 showed that during that year imports had increased and exports decreased as compared with 1923. In the latter year imports were 2,558 quintals, value 1,305,000 marks; these amounts more than trebled in the following year when the figures were 8,735 quintals, value 5,422,000 marks. Exports of rubber goods fell from 180,327 quintals, value 78,974,000 marks in 1923 to 146,125 quintals, value 72,376,000 marks, a decrease of about 20 per cent in quantity.

The chief exports were tubes, 2,887,283 quintals in 1924 against 3,710,044 quintals in 1923; tires and treads, 1,513,140 quintals and 2,355,917 quintals in 1924 and 1923 respectively; belting, hose and packing, 20,209 quintals in 1924 as compared with 25,328 quintals in 1923; footwear, 4,585 quintals in 1924 instead of 7,489 quintals in 1923; goods made of rubber and fabric combined, 13,759 quintals instead of 14,824 quintals; hard rubber and hard rubber goods, 9,803 quintals instead of 9,871 quintals.

German tires and tubes go chiefly to England and the British colonies, Holland, Switzerland, Denmark, Austria; in South America, Argentina is Germany's best customer for these goods. To the Baltic provinces go most of the footwear exports.

The exports of hose, 14,401 quintals, value 4,597,000 marks, are second only to those of the United States. The greater part went to Holland, Great Britain, Switzerland, Argentina and Denmark.

New Rubber Goods

The possibilities of sponge rubber evidently appeal to the German manufacturers, to judge from the increasing number of novelties made from this material. The Belinde-Werke A.-G., formerly Uebersee Gummiwerke A.-G., Hamburg-Wandsbek, has recently patented a number of articles for use in connection with water and heat therapy, all made of sponge rubber. These comprise neck compresses and warmers, shoulder, chest, abdomen, knee and back warmers, lung protectors, cushions, pads and the like.

The Harburger Gummiwarenfabrik Phoenix A.-G., in Harburg A. E., has just patented a new line of sponge rubber figures, balls, fruits and the like. The sponge rubber mixture is colored as desired and the figures are enameled in different colors or combinations of colors with rubber enamel.

The vogue for toys and other articles enameled in different colors appears to be in full swing. Some very attractive character dolls thus decorated are put out by the Thüringer Puppenindustrie G. m. b. H., a section of the B. Polack A. G., Waltershausen, Thuringen.

The dolls produced by the Excelsior Company are well calculated to appeal to young folks, particularly on account of the originality of the designs.

Herona Deutsche Gummi Gesellschaft m. b. H., Berlin, has some new inflatable toys. These represent devils, cats, Chinamen, Red Indians, etc., are provided with voices and appropriate decorations of fur and feathers.

The Continental Caoutchouc-und-Gutta Percha-Compagnie, Hannover, has put on the market a pneumatic cushion for radiophones in a variety of colors and designs.

Zacher & Semmler have three novelties to offer, a rubber sanitary binder; an automatic syringe that can be used in vessels of almost any shape, as for instance a wash basin; and a combination thermometer and pencil.

Berlin Trade Fairs

At an exhibition by the German clothing industry recently held in Berlin, over twenty manufacturers of rubber coats were represented. Since the war the number of manufacturers of this line of goods has increased enormously and at present all types of rubber and rubberized coats, from the cheapest to the finest qualities, are produced here. A novelty at the fair was a reversible rubber coat for ladies, in which the inside or rubber side is made to simulate leather in appearance.

The Continental Caoutchouc-und-Gutta Percha-Compagnie, Hannover, had a full line of its products in this field. Rappolt & Söhne, Hamburg, and Grünzweig & Schlesinger, Berlin, showed rubberized silk coats, besides other types. The Lincas-Gummiwarenfabrik showed a tasteful collection of bathing caps besides rubber coats. This firm uses ornaments of fabric on its caps. It had the novel idea of sending to interested parties the entire bathing cap collection in miniature instead of the usual catalogs.

At the Shoe and Leather Goods Fair, which opened in Berlin, on February 8, rubber footwear, heels, soles, insoles, tennis and bathing shoes, and crêpe soles were shown. It seems that crêpe soles are beginning to make headway here and they are now to be seen on tennis and sport shoes and also on street shoes.

The usual types of rubber soles and heels, particularly heels, are manufactured and used extensively here. Besides big firms like the Continental and Excelsior, whose products are probably the most popular, there are numbers of smaller and some quite small firms making heels and soles. Prices are regulated by a special selling organization so that the members of the organization sell at the same price. But non-members, chiefly the smaller firms, sell at lower prices. However, their goods are generally of inferior quality.

As a rule rubber heels are bought separately and are attached to the shoes by repair men. Prices to the latter are around 2.20 marks to 3.75 marks a dozen for women's heels and 5.05 to 5.50 per dozen for men's heels, according to size.

German Notes

The general manager of the New York-Hamburger Gummiwaren-Compagnie, Hamburg, Johann Friedrich Leopold Osbahr, celebrated his seventieth birthday on February 8. He was born at Neumühlen near Altona in 1855. In 1878 he joined the company of which he is now general manager. In the earlier years of his connection with the firm his activities took him to various parts of Europe and the Orient, and later to the United States and Canada, where he succeeded in introducing his firm's products. Herr Osbahr is director of a number of other companies besides his own.

German visitors to the seaside resorts are becoming acquainted with push ball and this game is likely to become popular

here. The difficulty is the ball. A manufacturer experimented with one of the usual size, about 3 feet in diameter, but unfortunately this proved too heavy for the women to handle. However, experiments will continue and it has been suggested that the ladies might find a smaller ball with roughened surface easier to manage than the larger one with smooth surface.

The decline in exports has aroused local manufacturers and dealers and the cause of this sad situation is being thoroughly gone into. It has been put forward that what Germany needs is a body that will do for the manufacturing industry what the Rubber Growers' Association is doing for the planting industry. Propaganda, extensive advertising, are advocated and American methods and expenditures in the latter connection are held up as examples for Germany to follow.

European Notes

Société Industrielle de Caoutchouc d'Argenteuil has been formed with a capital of 2,000,000 francs, chiefly to exploit a physico-chemical process of making hollow rubber goods. The main office is at 4 rue Edouard VII, Paris. The capital may later be raised to 5 million francs.

Etablissements E. Bouton, 51 rue du Temple, Paris, will manufacture silks, velvets, fabrics, hats and rubber goods. The capital is 6 million francs.

Etablissements Oyhenard, 2 rue Capéré, Vichy, capitalized at 6,000,000 francs, will manufacture and sell rubber goods for medical purposes and will also sell pharmaceutical accessories on commission. The firm has a factory at Cusset (Allier) and three establishments at Vichy.

Export of tires, tubes, casings of all kinds during 1924 amounted to 217,999 quintals (quintal is equivalent to 220.46 pounds). French tires find a good sale in most parts of the world, the largest consumers being Great Britain and the British colonies, Belgium, Switzerland, Spain, Italy, Holland and her colonies, Algeria, United States, Morocco, French Indo-China, Argentina, Brazil, Syria. Footwear exports from France during 1924 came to 25,853 quintals, most of which went to Belgium, Roumania, Holland, Switzerland, Turkey, England.

It is reported that a company has been formed in Copenhagen to manufacture rubber footwear. The capital of 1,000,000 kroner is fully subscribed and all-Danish. The technical management is to be in the hands of Gustav Theilgaard, son of the director of the rubber firm at Käge which recently failed. It is intended to work for export, particularly to the Baltic States.

At present over half the male population in the cities of Hungary use rubber heels. These are all produced locally, as importation of rubber heels is prohibited. The chief source of supply is the Hungarian Rubber Goods Factory, Ltd., Budapest, which sells a good medium article at prices ranging from about 4 to 17.3 cents per pair according to size, and a cheaper grade from 3 to 12.26 cents, wholesale.

Although about two-thirds of the more than 9,000,000 rubber heels used annually by the population of the cities of Yugoslavia are imported, no American makes are represented. The imported heels are supplied mainly by one Hungarian and one German firm. The use of rubber half soles is increasing and is expected to equal that of heels.

While only a very small percentage of the Swiss population wears rubber heels, crêpe rubber soles are coming into favor, and already some 10 per cent of locally produced shoes have crêpe rubber soles. The climate in Switzerland is damp and the rubber heels cause slipping on the wet pavements; hence their unpopularity. The type most in demand is of rubber with a leather center. The best selling heels are the Continental lines, the wholesale prices ranging from two francs a dozen for the cheapest revolving heels to 12.50 francs for the best rubber and leather heels.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
564	Source of supply of Bentonite.
565	Manufacturer of G.M.T. golf soles.
566	About making rubber stamps.
567	Source of supply of sandals or other footwear made from old tires.
568	Complete equipment for manufacture of rubber footwear and heels.
569	Rubber hose nozzle for cleaning automobiles.
570	Exclusive agency for mechanical rubber goods in Cincinnati territory.
571	Manufacturer of corrugated rubber matting.
572	Manufacturer of hard rubber pipe bits.
573	Dealers in crude gutta percha.
574	Manufacturers of finished gutta percha.
575	Where crêpe rubber mitts may be obtained.
576	Electric vulcanizers for rubber footwear.
577	Foreign inquiry for names of manufacturers of organic accelerators.
578	Names of manufacturers of pure gum tubing.
579	Address of manufacturer of Cumaline.
580	Machine to cut bands from old inner tubes.
581	Information on rubber cost accounting methods.
582	Manufacturer of "live leather" belts.
583	List of buyers of seconds in toy balloons.
584	Source of supply of rubber solutions for experimental work.
585	Machine for cutting raw rubber in the bale.
586	Source of supply of wood pulp.
587	Manufacturer of rubber erasers.
588	Source of supply of coin mats.

Foreign Trade Opportunities

Address and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th Street, New York, N. Y.

Number	Country and Commodity	Purchase or Agency
13,766	Egypt—Tire repair materials and vulcanizing equipment	Agency
13,770	Germany—Balloons and fountain pen sacks	Agency
13,849	Colombia—Tires	Purchase and agency
13,870	Ceylon—Tires and rubber goods	Purchase and agency
13,899	Australia—Elastic webs and suspender cords	Agency
13,921	Sweden—Duck, rubber	Purchase
13,922	Netherlands—Raincoats, rubber	Agency
13,936	Netherlands—Rubber heels	Exclusive agency
13,942	Haiti—Rubber shoes and shoe heels	Agency
13,990	India—Rubber heels	Purchase and agency
13,992	Denmark—Rubber shoes	Agency
14,012	Germany—Balloons and other rubber novelties	Purchase
14,013	Germany—Balloons and fountain pen sacks	Agency
14,027	Iraq (Mesopotamia)—Tires	Purchase and agency
14,033	South Africa—Balloons and rubber toys	Agency
14,118	Argentina—Rubber hose	Exclusive agency
14,148	Sweden—Sheeting and other rubber goods for hospitals	Agency
14,203	Uruguay—Balloons and other rubber toys	Agency
14,204	France—Rubber and balata belting	Agency

FOREIGN RUBBER TRADE INFORMATION

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

Number	Special Circular
788	"Export Market for Rubber Heels in Budapest, Hungary," etc., etc.
792	"Export Market for Rubber Heels in Batavia, Java," etc., etc.
*793	"French Exports of Tires and Rubber Shoes."
*795	"Chilean Market for Machinery Belting."
*798	"German Exports of Rubber Footwear."
*799	"German Exports of Rubber Hose in 1924."
800	"Export Market for Rubber Heels in Gibraltar," etc., etc.
*802	"Canadian Exports of Rubber Footwear."
*804	"Market for Machinery Belting in British Honduras."
*805	"Market for Machinery Belting in Salvador."
*806	"Market for Machinery Belting in Guatemala."
*809	"Brazilian Market for Machinery Belting."
*812	"Market for Water Bottles and Syringes in Venezuela."
*813	"Greek Market for Machinery Belting."
*814	"Market for Rubber Heels in Switzerland."
*815	"British Exports of Automobile Casings and Rubber Boots and Shoes."
816	"Tire Market of San Salvador, El Salvador," etc., etc.
*819	"Belgian Market for Machinery Belting."
820	"Expansion of Norwegian Rubber Footwear Factory," etc., etc.
*821	"Market for Machinery Belting in Costa Rica."

Recent Patents Relating to Rubber

The United States

Issued* February 17, 1925

NO. 1,526,313 Syringe. T. W. Blakeslee, Erie, Pennsylvania.
1,526,417 Sponge rubber athletic pad. H. Goldsmith, assignor to The P. Goldsmith Sons Co., both of Cincinnati, Ohio.
1,526,457 Bather's waterproof case. H. T. Brooks and H. Douglas, both of Baltimore, Maryland.
1,526,473 Self-healing compression inner tube. B. G. Goble, Tulsa, Oklahoma.
1,526,503 Semisolid tire. C. S. Preston, San Diego, California.
1,526,795 Inflatable stomach pad. J. C. Knapp, J. J. Donnelly, and D. A. Cannatella, all of Brooklyn, New York.
1,526,817 Electric storage battery employing rubber tubes. F. Wright, assignor of one-half to J. A. Purcell, both of Poughkeepsie, New York.
1,526,857 Tire valve casing cap. F. C. Hughes, Chicago, Illinois.
1,526,867 Elastic retaining band for pocketbook. G. W. Peterson, Bradford, Pennsylvania.
1,526,913 Dual-tired truck wheel. L. D. Kay, Los Angeles, California.
1,526,942 Storage battery separator employing unvulcanized rubber. G. Steerup, Chicago, Illinois.
1,527,116 Toy balloon. H. Burkart assignor of one-half to N. Blake, both of Oshkosh, Wisconsin.

Issued* February 24, 1925

1,527,173 Plywood sole with rubber tread. J. E. M. Cooke, Rising Brook, Stafford, England.
1,527,249 Sponge rubber cushion. W. C. Chapman, Woodword, England.
1,527,321 Demountable emergency automobile tire. L. K. McClellan, Beltrey, Montana.
1,527,436 Air pressure gage. R. P. Oxley, assignor of one-half to W. H. Fifer, both of Salisbury, North Carolina.
1,527,700 Bead for straightside tires. A. J. Pennington, East Cleveland, Ohio, assignor to National-Standard Co., Niles, Michigan.
1,527,716 Apparatus for practicing golf, etc. F. J. Tippen and H. K. Prosser, both of Birmingham, England.
1,527,862 Inflatable tire. B. G. Goble, Tulsa, Oklahoma.
1,527,863 Inflatable tire. B. G. Goble, Tulsa, Oklahoma.
1,527,882 Syringe. J. B. A. La Jeunesse, Alameda, California.

Issued* March 3, 1924

1,528,315 Instrument for measuring the internal circumference of tires and like rings. A. Barr and W. Stroud, Glasgow, Scotland, and W. de la R. Bond, Birmingham, England, assignors to Barr & Stroud, Ltd., Glasgow, Scotland.
1,528,492 Tire valve. H. P. Kraft, Ridgewood, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, New York.
1,528,648 Rubber golf stick grip. G. M. Armstrong, assignor to Armstrong Golf Grip Corp., both of Baltimore, Maryland.

Issued* March 10, 1924

1,528,888 Cushion tire. M. C. Overman, New York, N. Y.
1,528,909 Golf practice apparatus with elastic tether. E. S. Bullard, assignor of one-half to W. E. Weiss, both of Wheeling, West Virginia.
1,529,124 Battery box. A. A. Glidden and J. E. Perrault, assignors to Hood Rubber Co., all of Watertown, Massachusetts.
1,529,390 Closure comprising a rubber body. H. K. Brown, Chicago, Illinois, assignor to Cook Laboratories, Inc., a corporation of Delaware.
1,529,491 Armored interliner. A. Manvers, assignor to M. Kelly, both of London, England.
1,529,600 Ball and bat toy with elastic connection. W. R. Lind, Cincinnati, Ohio.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted February 17, 1925

246,807 Detachable heel. R. B. Chalue, Toronto, Ontario.
246,935 Non-metallic cushion connection for vehicles. The International Motor Co., assignee of A. H. Leipert and J. Goldsmith, all of New York, N. Y., U. S. A.

Granted February 24, 1925

247,004 Rubber-plywood wheel. H. N. Atwood, Monson, Massachusetts, U. S. A.
247,071 Rubber and wire flooring strip. S. G. Rigdon, Berea, Ohio, U. S. A.

Granted March 3, 1925

247,222 Life-saving device employing inflatable gas bag. N. Cherniak, Bethlehem, Pennsylvania, U. S. A.
247,359 Pressure gage. A. Schrader's Sons, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, New Jersey, both in U. S. A.
247,363 Tennis ball. The Slazengers, Ltd., assignee of N. G. Groves, both of London, E. C. 4, England.

Granted March 10, 1925

247,426 Cushion tire. W. A. Brubaker, Akron, Ohio, U. S. A.
247,432 Cellular tire. J. C. Casteran, Buenos Aires, Argentine.
247,478 Blowout-proof pneumatic tube. G. F. Mohlman, Edmonton, Alberta.
247,481 Rubber-impregnated paper-like product. K. L. Moses, Brookline, Massachusetts, U. S. A.

The United Kingdom

Published February 11, 1925

226,292 Crêpe rubber riding saddles. S. Oram, 24 Hardwick street, Buxton, Derbyshire.
226,320 Foot-arch supports. A. Kari, 60 Falmouth Road, Heaton, Newcastle-on-Tyne.
226,330 Sponge rubber balls for table games. L. F. Klein, 6 Christopher street, Newton Heath, Manchester.
226,348 Adhesive comprising glue, flour, and rubber. D. Cameron, Vermilion, Alberta, Canada.
226,355 Rubber tread for boots and shoes. B. W. Redhouse, High street, Tollesbury, near Maldon, Essex.
226,358 Magazine or box spanner with rubber buffer W. T. Fisher, 12 Queen's Road, Coventry.
226,395 Exercising apparatus employing elastic cords. H. J. Wareham, 12 London Road, London.
226,457 Protective cover for drawer-and-shell match box, employing a rubber band extruder. M. Donn, 49 Via XX Settembre, Turin, Italy.
226,459 Garter. G. O. B. Hackett, The Vicarage, Belsize Square, Hampstead, London.
226,469 Adjustable bandeau for hats, employing elastic bands. S. Thornley, Boston Mills, Hyde, and J. C. Foden, Penrhos Park Road, Timperley, both in Cheshire.
226,473 Rubber tread band for tires. Kaupy & Schoenmann, 5 Zollergasse, Vienna.
226,507 Sponge rubber pessary. W. G. Hill, Queensville, Ontario, Canada.
226,545 Sponge rubber and felt seat pad or cushion. G. Frazier, Sebring, Ohio, U. S. A.

Published February 18, 1925

226,579 Rubber and metal non-skid device for horseshoes, tires, etc. J. S. Withers, 51 Chancery Lane, London.
226,591 Elastic bow-fastening device for slippers. D. Pain, 17 Farringdon avenue, Ludgate Circus, London.
226,664 Crêpe rubber trumpet toy. M. M. Dessau, 14 Mincing Lane, London.
226,679 Rubber lined channel guide for vehicle window frames. G. Beaton & Son (1919) Ltd., G. H. and W. E. H. Johnstone, 41 St. James' Square, Holland Park, London.
226,685 Rubber insulated electric cables. Siemens Bros. & Co., Ltd., Caxton House, Tothill street, London, and W. F. Oakfield, Bedonwell House, Bedonwell Hill, Belvedere, Kent.

Published February 25, 1925

226,860 Letter signs used with a support of cork or rubber. S. J. Democratis, 41 Parolles Road, Highgate, London.
226,896 Elastic saddle girth. W. H. McLean, 145 Dandenong Road, Malvern, Victoria, Australia.
226,965 Tennis balls. C. E. Allsopp, Aberdora Villa, Dollar, Clackmannanshire.
226,985 Respirator with valve employing rubber tube and diaphragm. K. W. G. Davis, 187 Westminster Bridge Road, London.
227,032 Rubber cushion or hand guard for broom handles, etc. F. B. Jones, Chandos, Greenhill Road, Harrow, Middlesex.
227,041 Golf playing device employing rubber tees, etc. T. H. Gledhill, Royal Golf Club, L'Ancresse, Guernsey.
227,075 Rubber cushioned horseshoe. F. C. Robertson, 1721 West Riverside Avenue, Spokane, Washington, and P. P. Rooney, Buffalo, New York, both in U. S. A.

New Zealand

Published December 31, 1924

52,938 Rubber heel. W. F. Flesselles, 9 Martin Place, Sydney, N. S. W.

Germany

Patents Issued With Dates of Issue

409,928 (July 16, 1921). Pneumatic tire. Winfield P. Porter, New York; represented by: Dr. R. Geissler, Berlin, S. W. 11.
410,206 (June 23, 1923). Cushion of rubber or rubber substitute. Paul Weinheimer, Schäferstrasse 16, Düsseldorf.
410,262 (June 3, 1924). Suction and pressure ball. Curt Mayer-Bührer, Lindenstrasse 6, Berlin.
410,504 (February 23, 1924). Light metal insert for tires, tubes and other rubber articles. Wilhelm Kaiser and Leonhard Madlener, Stiftstrasse 20, Frankfurt-am-Main.

Chemical patents will be found on page 409, Machinery and Process Patents on pages 413-414.

Germany

Design Patents Issued With Dates of Issue

894,503 (May 19, 1924). Non-skid device for trucks with twin solid tires. Deutsch-Luxemburgische Bergwerks-und Hütten A.-G., Dortmund, Abt. Carl Schlieper, Grüne-Iserlohn.

894,526 (November 6, 1924). Inner tube. Friedrich Wilhelm, Oberaudorf, Bayern.

894,700 (December 22, 1924). Rupture band with pneumatic pelote. Dr. K. Giesemann, Eisenach.

894,720 (June 7, 1924). Rubber sole for sport shoes. Heinrich Chorman, Birkenstrasse 71, Dusseldorf.

894,742 (November 18, 1924). Toy bladder. Hannoversche Gummiwerke Excelsior, A.-G., Hannover-Limmer.

894,812 (July 18, 1924). Flying toy. Ifak, Internationale Fabrikations-Gesellschaft für Kautschukwaren m. b. H., Berlin.

895,029 (October 20, 1924). Flying toy. Ifak, Internationale Fabrikations-Gesellschaft für Kautschukwaren m. b. H., Berlin.

895,176 (December 4, 1924). Sponge rubber foot. Gerhard Schützler, Zimmerstrasse 97, Berlin.

895,181 (December 8, 1924). Apron of rubberized satin. Hugo Engel, Frankfurterstrasse 24, Leipzig, L.

895,232 (October 11, 1924). Sanitary binder. Heinrich Wendel, Nürnbergerstrasse 7, Leipzig.

895,263 (November 27, 1924). Hygienic protective cover of sponge rubber. Erdmann Ahrend, Blankenese.

895,272 (November 28, 1924). Hypodermic syringe. Thekla Knöbel, Basel, Switzerland; represented by: G. Scheib, Markusstrasse 18, Berlin.

895,311 (December 19, 1924). Rubber heel of crêpe rubber with patch. Heinrich Becker, Bürkleinstrasse 5, Münich.

895,320 (December 31, 1924). Marking ring of colored rubber. Dr. Clemens Vogelgesang, Kupferstrasse 14, Aachen.

895,542 (December 3, 1924). Sponge rubber cover. Marie Fromhold, né Kuntze, Blankenese.

895,561 (December 12, 1924). Acid bucket. Gummiwerke Ernst Kniepert, Löbau i. S.

895,567 (December 15, 1924). Rubber closing for chloride of ethyl tubes in the shape of a blunt cone. Dr. Walter Boltze, Mellenbach.

895,582 (December 19, 1920). Sanitary binder. Uebersee-Gummiwerke, A.-G., Wandsbek.

895,599 (December 24, 1924). Removable covering for operating tables. Uebersee Gummiwerke, A.-G., Wandsbek.

895,683 (March 24, 1923). Closing for footballs and the like. Thomas Dudson, Abertridwe near Cardiff, Wales; represented by: Dr. R. Geissler, Berlin S. W. 11.

895,725 (December 9, 1924). Milking cup with rubber suction. Brdr. Bendix, Copenhagen, Denmark; represented by: Dr. Haussknecht and Morin, Berlin W. 57.

895,891 (December 8, 1924). Washstand mat set of rubber. Hanna Valeska Westphal, Frankenallee 83, Frankfurt-am-Main.

895,906 (December 12, 1924). Foot bandage. Bremer Gummiwerke Roland A.-G., and Dr. Heinz Oppermann, 88-90 Hamburgerstrasse, Bremen.

895,994 (December 27, 1924). Inflatable rubber caricature toy. Max Manfred v. d. Heyden, Helmstedterstrasse 17, Berlin-Wilmersdorf.

896,123 (October 17, 1924). Syringe. Alfred Thomae, Wolfsgangstrasse 47 a, Frankfurt-am-Main.

896,265 (November 27, 1924). Cushion or the like with cover of sponge rubber filling. Erdmann Ahrend, Blankenese.

896,365 (December 22, 1924). Grooved rubber belt. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

896,366 (December 22, 1924). Handle for motorcycles. Harburger Gummiwarenfabrik Phoenix, A.-G., Hamburg a. E.

896,579 (December 24, 1924). Sponge rubber soap mat. Hermann Glaser, Cleve.

896,616 (September 8, 1924). Sanitary bandage. Else Lottermann, Ohmstrasse 18, Frankfurt-am-Main.

896,633 (November 21, 1924). Rubberized apron in which the two sides are of different colors. Gustav Berlinger & Co., Stuttgart.

896,645 (December 9, 1924). Vaginal pessary. Dr. Friedrich Kraeger, Johann-Georgen-Allee 35, Dresden.

896,666 (December 23, 1924). Rubber balloon joker in the form of an animal's head. Max Manfred v. d. Heyden, Helmstedterstrasse 17, Berlin-Wilmersdorf.

896,824 (November 26, 1924). Ink bottle having sponge rubber ring around its neck. Gummiwerke Elbe, A.-G., Klein-Wittenberg A. E.

896,974 (January 2, 1925). Uterine catheter for treating large animals. Firma Hermann Katsch, Munich.

896,975 (January 2, 1925). Inhalation powder spray. Firma Hermann Katsch, Munich.

896,993 (January 5, 1925). Packing for vesta matches. Hannoversche Gummiwerke Excelsior A.-G., Hannover-Limmer.

897,034 (December 6, 1924). Braid holder with rubber band. Carl Konze and August Ahring, Schötmar.

897,182 (January 3, 1924). Dice cup. Mittelland Gummiwerke A. G., Hannover-Linden.

897,317 (January 7, 1925). Heel patch of rubber or similar substance. Heinrich Ellerbrack, Gross-Flottbek.

897,320 (January 7, 1925). Rubber tire. Adalbert Probst, Pirmasens.

897,322 (January 7, 1925). Pneumatic ring seat for bed pans. August Schultz, Gretchenstrasse 35, Hannover.

897,470 (December 22, 1924). Bathing and rubbing accessories of sponge rubber. Harburger Gummiwarenfabrik Phoenix, A.-G., Harburg, a. E.

897,498 (January 9, 1925). Laces with rubber tips. Heinrich Hochle, Franseckystrasse 15 a, Duisburg-Meiderich.

897,557 (December 30, 1924). Horseshoe with rubber soles. Gustav Münzel, Burgberg, O. A., Heidenheim, Württenberg.

897,573 (January 8, 1925). Sponge rubber pad insert for sanitary binders. Cerifa Celluloid und Gummiwaren-Fabrik Fischer & Potsch, Hannover.

897,578 (January 8, 1925). Sanitary binder. Gustav Hermann Senf, Oeserstrasse 5, Leipzig-Schleussig, and Arno Kühne, Zschochersche strasse 51, Leipzig-Plagwitz.

897,687 (January 10, 1925). Gutta percha tip for nerve canals. Firma Paul Odze, Georgstrasse 13, Hannover.

897,701 (January 22, 1925). Rubber coat with ventilation. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

897,809 (June 15, 1924). Knee pad attachment. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

897,859 (December 30, 1924). Rubber figure. Erich Ouednow, Wulferstedt.

897,862 (January 2, 1925). Elastic fabric for bandages, corsets and the like. Emil Otto Stöckermann, Barmen, W.

897,982 (January 13, 1925). Rubber doll. Vulkan Gummiwarenfabrik fabrik Weiss & Baessler A.-G., Leipzig-Lindenau.

897,983 (January 13, 1925). Toy figure of rubber. Vulcan Gummiwarenfabrik Weiss & Raessler A.-G., Leipzig-Lindenau.

898,063 (December 30, 1924). Rubber toy with skin. Hedwig Maria Huldschinsky, née Strasser, Knesebeckstrasse 78-79, Charlottenburg.

898,075 (January 3, 1925). Hair bandeau with rubber insert. Franz Polaschewsky, Witten a. d. Ruhr.

898,189 (December 22, 1924). Multi-colored rubber sheet. Continental Caoutchouc und Gutta Percha Compagnie, Hannover.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted February 17, 1925, Act of February 20, 1905

195,008 VELPED—rubber bathing slippers. The American Rubber & Tire Co., Akron, Ohio.

195,022 Within a double-ruled wavy border the word: SELZWEL, the first and last letters being larger than the rest—baby pacifiers, finger cots, nursing nipples, and various druggists' sundries. Louis Boettiger Co., New York, N. Y.

195,056 SPEEDY SHOES—shoes of rubber, leather, fabric or combinations. Young Shoe Co., Los Angeles, California.

195,067 MA JONGG, in letters simulating Chinese characters—rubber tea aprons, bibs, bathing caps, etc. Polkase Manufacturing Co., Inc., New York, N. Y.

195,079 EMPRESS—pencils, penholders and rubber composition erasers. Eberhard Faber Pencil Co., Brooklyn, New York.

195,102 PRESTO, in fancy lightface type having a design simulating sun rays in the background—rubber reducing garments. Climax Rubber Co., New York, N. Y.

195,104 PARO—nursing nipples. Block Manufacturing Co., New York, N. Y.

195,106 PENNDELPHIA, in a fancy script—shoes of leather, rubber, fabric, and combinations. Smaltz-Goodwin Co., Philadelphia, Pennsylvania.

195,124 Representation of a tire crossed horizontally by the representation of a shoe sole bearing the words: WEYENBERG'S TIREX—boots and shoes made wholly or in part of leather and heels and soles of rubber. Weyenberg Shoe Manufacturing Co., Milwaukee, Wisconsin.

195,231 Representation of a shoe sole displaying the letter B in each of its suction cups and the word BELMONT across the sole horizontally—rubber half soles. Charles Hale & Bro., Philadelphia, Pennsylvania.

Granted February 24, 1925, Act of February 24, 1905

195,294 SHORTEX—rubber bathing slippers. The American Rubber & Tire Co., Akron, Ohio.

195,463 A color line longitudinally disposed upon a representation of a square of material and formed of one black warp alternating with two red ones—linen fire hose. Wm. & Chas. Beck, Inc., Lawrence, Massachusetts.

195,593 The word SUPER-WELD within a broad annular space provided by border lines of a circle—rubber repair outfits. Super-Weld Manufacturing Co., Searsmont, Maine, and Columbia, South Carolina.

195,603 Representation of a sprite emerging from a circular background with black center, and the word: ELAST—inner tubes for tires. W. T. Grant Co., Lynn, Massachusetts, and New York, N. Y.

Granted March 3, Act of February 20, 1905

195,649 Figure somewhat resembling a wheel, the spokes of which separate the letters L K. L K.—shoes of leather, rubber, fabric, or combinations. Eduard Lingel, Schuhfabrik A. G., Erfurt, Germany.

195,681 The word MUSKIN, back of which is the representation of a pyramid of Egypt, a camel, palm trees, and another pyramid visible in the background; beneath this the words: BUILT LIKE THE PYRAMIDS—shoes of leather, rubber, fabrics and combinations. Muskin Shoe Co., Baltimore, Maryland.

195,719 Representation of a sole of a foot, across which is printed longitudinally the word: "OSTEO-PATH-IK"—shoes of leather, rubber, fabric or combinations. Allen-Speigel Shoe Manufacturing Co., Belgium, Wisconsin.

195,797 On an oval-shaped black background the word: IMPS in large white letters, and above this the representation of one sprite being chased by another with pumpkin head—children's shoes of leather, rubber, fabric or combinations thereof. Foot, Schulze & Co., St. Paul, Minnesota.

195,848 The words: STONE MOUNTAIN, and beneath the last letter a monogram formed by the letters J. K. O.—shoes of leather, rubber, fabric or combinations thereof. J. K. Orr Shoe Co., Atlanta, Georgia.

195,875 The words: KANT BLO, the O being a representation of a tire with a patch displayed; above this within a parallelogram the words: CAN'T BLOW—tire patches. Double Lock Patch & Rubber Co., Washington, D. C.

195,886 The words: HOMAN'S PERSONALITY SHOES on a fancy black scroll—ladies' shoes, slippers and boots, of leather, rubber, fabric, or combinations. The Homan-Hughes Co., Cincinnati, Ohio.

195,903 THE BESTAP, the last word twice underscored—shoe soles of crude rubber and compounding materials. J. Ullman & Sons, Reading, Pennsylvania.

195,919 MARON, within a diamond-shaped outline, the letters being graded in size from the middle letter to the ends—rubber, cotton and linen hose and belting; rubber packing and jar rings. J. W. Buckley Rubber Co., New York, N. Y.

195,920 MONOL, within a diamond-shaped outline—rubber, cotton, and linen hose and belting; rubber packing and jar rings. J. W. Buckley Rubber Co., New York, N. Y.

195,921 QUAMOL, within a diamond-shaped outline, the letters graded down in size from the center—rubber, cotton, and linen hose and belting; rubber packing and jar rings. J. W. Buckley Rubber Co., New York, N. Y.

Granted March 3, 1925, Act of March 19, 1920, Section 1(b)

195,928 The word: ORTHO and diagonally opposite this the word: ARCH—boots and shoes of leather, rubber, fabric, and combinations. Lund-Williams Shoe Co., St. Louis, Missouri.

195,943 RACINE—inner tubes, Racine Rubber Co., Racine, Wisconsin.

Granted March 10, 1925, Act of February 20, 1905

196,149 Representation of a pump diaphragm having a black stripe either painted thereon or vulcanized therein—rubber diaphragms for pumps. Ralph B. Carter Co., New York, N. Y.

196,150 TAURUS—tennis balls. The Hungarian Rubber Goods Co., Ltd. Budapest, Hungary.

196,159 OILTEX, in distinctive lettering—coats, hats and jackets. Cambridge Rubber Co., Cambridge, Massachusetts.

196,189 EVERNU—rubber heels. Evernu Rubber Heel Corp., New York, N. Y.

196,222 KENLASTIC—corsets, corset elastics, etc. James R. Kendrick Co., Inc., Philadelphia, Pennsylvania.

196,226 Representation of PETER PAN seated on a mountain of clouds, two sprites flying near; stars and a crescent moon; name PETER PAN above the figure—hose supporters and garters. American Wholesale Corp., Baltimore, Maryland.

196,238 SORBO—sponge rubber shoe soles and linings for helmets and hats Sorbo Rubber-Sponge Products, Ltd., Woking, England.

The Dominion of Canada

Registered

37,153 VELVETILE—sheet rubber flooring, mats, desk pads, desk or table covers, rubber wainscoting, wall covering and stair treads. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

37,161 "STAND FAST"—rubber cushions for billiard tables. Thurston & Co., Ltd., 45-46 Leicester Square, London, England.

37,229 VELVETRED—sheet rubber flooring, mats, desk pads, desk or table covers, rubber wainscoting, wall covering and stair treads. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

37,273 EXPRESS—rubber plates or pads for heels and soles. Phillips' Patents, Ltd., 142 Old Street, London, E. C. 1, England.

New Zealand

Registered

B20,232 HEAVY TOURIST—pneumatic tires and tubes of rubber or rubber and fabric. The Goodyear Tire & Rubber Co., Akron, Ohio, U. S. A.

20,344 BEAR—steam packing, hydraulic packing, hose, and tubing included in Class 50. The Leyland & Birmingham Rubber Co., Ltd., London, England.

20,450 KELLY SPRINGFIELD AIRCORE, the first two words being arranged one above the other and over an extension of the first stroke of the letter A in the last word—tires made entirely or partly of rubber. Kelly-Springfield Tire Co., New York, N. Y.

22,197 TRUCO—combs for the hair, cigar and cigarette holder, etc. Traun Rubber Co., Ltd., 57 Rathmines Road, Dublin, Ireland.

The United Kingdom

Published February 11, 1925

451,368 Representation of a key—goods of rubber or gutta percha exclusively in Class 40 but not including dress shields, elastics, tires, or accessories, sheet rubber, rubber patches, rubber solution, rubber covered wire, etc. Selfridge & Co., Ltd., 400 Oxford street, London, W. 1.

453,440 The word: PANCORD, describing a semicircle—rubber heels. Panther Rubber Co., Ltd., 29 Jencks Lane, Sherbrooke, Quebec, Canada.

454,389 SUPERSIS—rubber hose included in Class 50. The Electric Hose & Rubber Co., Ltd., 198-200 Westminster Bridge Road, London, S. E. 1.

454,407 SERPENT—hose included in Class 50. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E. C. 3.

454,970 NEMOLASTIK—corsets, brassieres, etc., for women's wear. Kops Bros., Inc., New York, N. Y., U. S. A. For service in the United Kingdom address: Brewer & Son, 33 Chancery Lane, London, W. C. 2.

Published February 18, 1925

431,401 FEDERAL—rubber tires. Cooperative Wholesale Society, Ltd., 1 Balloon street, Manchester.

454,616 FLOAT-ON-AIR—inflatable rubber cushions. David Moseley & Sons, Ltd., Chapel Field Works, Ardwick, Manchester.

Published February 25, 1925

448,267 Representation of an airplane on which are the words: ABOVE ALL OTHERS, and beneath which are the words: AEROPLANE BRAND—all goods in Class 40 but not including machine belting, garter webs, cords, braids, looms or any covered elastic goods. James Russell & Co. (Newcastle), Ltd., 2-5 Westgate Road, Newcastle-on-Tyne.

Published March 4, 1925

452,918 Representation of an eagle with outspread wings poised upon a diamond-shaped figure bearing the word: CARNOS; emanating from the figure are lines indicating light rays—goods of rubber or gutta percha exclusively in Class 40, but not including dress shields, elastic cords, braids, webs, corset laces and brace ends, or similar goods. Lewis Frankenberg, 15 Stoney Lane, Houndsditch, London, E. 1.

454,048 MACFLEX—goods of rubber or gutta percha exclusively in Class 40. Chas. Macintosh & Co., Ltd., 2 Cambridge street, Manchester.

Designs

The United States

66,616 Tire. Term 3½ years. W. R. Denham, Cleveland, Ohio.

66,639 Tire tread. Term 3½ years. G. C. McConnell, Massilon, Ohio, assignor to Fidelity Tire & Rubber Co., a corporation of Illinois.

66,640 Tire tread. Term 3½ years. C. Murray, Birmingham, Alabama.

66,670 Tire casing. Term 14 years. J. D. Comstock, Chester, West Virginia.

66,735 Tire shoe. Term 7 years. P. H. Hermsen, Little Chute, Wisconsin.

66,783 Tire. Term 14 years. R. A. Wurtzburg, Portland, Oregon.

The Dominion of Canada

6,526 Rubber heel pad for boots and shoes. Phillips Rubbers, Ltd., 142-146 Old street, London, England.

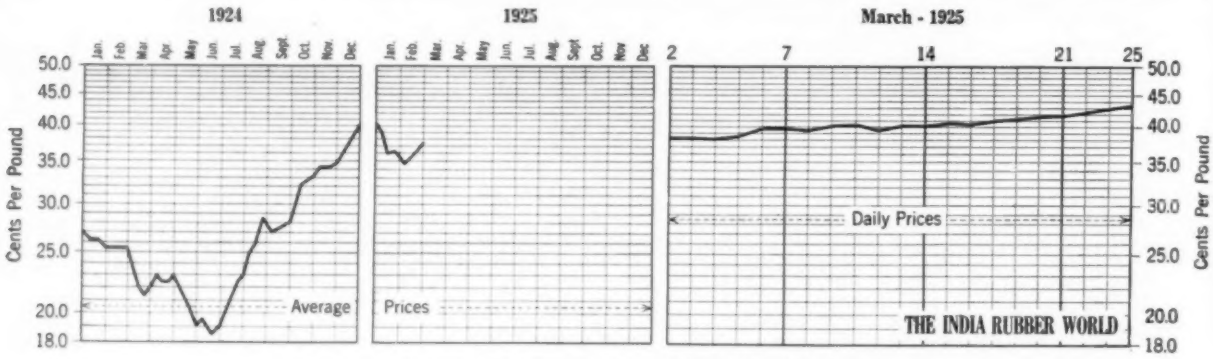
6,564 Golf ball. Game Balls Co., Ltd., Windmill Road, Brentford, Middlesex, England.

SECOND ANNUAL SURVEY OF TIRE DEALERS' STOCKS

A second survey of the stocks of tires in the hands of dealers and manufacturers will be taken by the Rubber Division of the Department of Commerce as of April 1, 1925. This will be the third such survey to be taken. One year ago the Rubber Association of America conducted the work but the survey of October 1, 1924, was taken over by the Rubber Division, which plans to repeat the work twice each year.

Every tire dealer in the United States should make a return to the department showing details concerning his tire stocks as of April 1. The questionnaire which tire dealers will receive should be given careful attention just as soon as it is received.

With adequate tire stocks, dealers will be prosperous; with excess stocks their position will be hazardous again. Hence the importance of every dealer doing his share in determining just how many tires there really are in the United States on April 1.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

The crude rubber market has for weeks been gaining strength, due to the depletion of stocks by heavy consuming demand and the restriction of exports of plantation grades under the Stevenson plan. In consequence spot ribbed smoked sheets have steadily advanced, rising from 37¼ cents on February 24 to 43½ cents on March 25. This is the highest price since April, 1920.

Recent London cables report the position as very tight with only 70 per cent of March shipments tendered. Continued depletion of stocks is anticipated and a squeeze is not impossible. Even two consecutive 10 per cent releases under the Stevenson plan will not be adequate unless there is also a decrease in consuming demand.

The market condition the last week in February was extremely firm. Factories were watching the situation closely but refrained from buying. Prices gradually advanced on account of the scarcity of spot, which was firmly held with but few sellers. The few shipments and offers from the Far East and the diminishing stocks in London continued to bring futures closer than usual to nearby prices.

During the first week in March purchases by large American factory interests both in London and Singapore, continued shortage in shipments, offerings, and stocks steadily forced prices upward. Further increase in price when consumers are obliged to renew their supply was predicted.

The market gained further strength the second week from the stringency of supply conditions, forcing the consumers to supply their needs sparingly.

During the third week factory interest was confined to nearby positions only and consumers did not care to cover futures at present levels. There was not much actual buying done yet enough to hold the market firm, with spot very much needed.

Up to March 25 the market continued strong with advancing prices. On that date April spot ribs sold at 43½ cents. Some factors deem 50 cent rubber not unlikely on the present rise. First latex crêpe ruled nearly a cent over ribs the entire month.

Parás and balatas, late in February, were dull and neglected. In March Parás rose in sympathy with plantations, while balatas remained steady and dull.

A strong demand for wild Congo rubbers became evident last year. In fact these sorts continue to be highly valued despite the enormous production of plantation grades. The Antwerp offerings at auction run from 100 to 150 tons of Congos and are bringing good prices.

Importations of all grades during February, 1925, were 23,456 tons, compared with 31,763 tons one year ago. Plantation arrivals for February were 21,740 tons, compared with 29,977 tons one year ago. Total importations of plantation rubber for two months ended February 28 were 50,220 tons, compared with 50,588 tons for the corresponding period of 1924. Total importations of all grades of rubber for the two months ended February 28 were 53,416 tons, compared with 53,374 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

Plantation. March 2. Spot first latex crêpe, 39 cents; March, 39 cents; Apr.-June, 38¾-38⅞ cents; July-Sept., 37¾-37⅞ cents; Oct.-Dec. 36⅞-37 cents.

March 24. Spot first latex crêpe, 43¼ cents; April 42⅞ cents; May-June, 42½ cents; July-Sept., 41¾ cents; Oct.-Dec., 40⅞ cents.

March 2. Spot ribbed smoked sheets, 38⅝ cents; Mar., 38⅝ cents; Apr.-June, 38 cents; July-Sept., 37⅛-37¼ cents; Oct.-Dec., 36¾-37 cents.

March 24. Spot ribbed smoked sheets, 43 cents; April, 42½ cents; May-June, 41¾ cents; July-Sept., 40¾ cents; Oct.-Dec., 40⅝ cents.

March 2. Spot No. 2 amber crêpe, 38½ cents; Mar., 38⅝ cents; Apr.-June, 38-38¼ cents; July-Sept., 37¾-38 cents; Oct.-Dec., 37¼-37⅜ cents.

March 24. Spot No. 2 amber crêpe, 42½ cents; April, 42¼ cents; May-June, 41½ cents; July-Sept., 40½ cents.

New York Spot Closing Rubber Prices

Prices in Cents, Per Pound

PLANTATIONS	February, 1925												March, 1925											
	16	17	18	19	20	21	*23	24	25	26	27	28	2	3	4	5	6	7	9	10	11	12	13	14
Sheet																								
Ribbed smoked	36⅞	36⅝	35½	36⅛	36⅜	36⅜	....	37⅛	37⅛	37⅛	37⅞	38⅛	38⅛	38⅛	38⅛	38⅝	39¼	39¼	39⅝	40¼	40¼	39⅝	40⅛	40⅛
Crêpe																								
First latex	37½	37¼	36⅞	37⅛	37½	37¼	....	37¾	37⅝	37⅞	38⅛	39	39	38⅞	38¼	39¼	40½	40⅝	40¼	40¾	40⅜	40⅜	41	40⅞
Off latex	37⅛	37	36¾	36⅞	37⅜	37½	....	37¼	37⅜	37⅝	38⅛	38¼	38¾	38½	38¼	38⅝	39⅞	39⅞	39¼	40⅛	40¼	40⅛	40½	40⅛
No. 2 blanket	36½	36⅜	35½	35⅞	36¼	36	....	36⅝	36⅝	36¾	37⅝	37⅞	38⅛	38	37⅞	38⅜	39½	39½	39½	39¾	40	39⅝	39¾	39¾
No. 3 blanket	36¼	36⅛	35⅜	35⅝	36	35⅞	....	36¼	36⅜	36⅛	37⅜	37⅝	37¾	37¾	37½	38	39⅛	39¼	39⅛	39⅜	39⅝	39⅜	39½	39½
No. 4 blanket	35⅞	35¾	35⅛	35⅜	35¾	35⅝	....	36	36⅛	36¼	37	37⅜	37½	37½	37⅛	37¾	39	38⅞	38¾	39	39¼	39⅛	39½	39⅜
Thin, clean brown	36⅛	36¼	35⅜	35¾	36	35⅞	....	36⅜	36⅜	37	37⅛	37⅞	37⅝	37⅞	37¾	38⅛	39⅜	39⅛	39⅛	39⅝	39¾	39½	39½	39⅝
Specky brown	35½	35⅞	35⅛	35⅝	35¾	35½	....	35⅝	35¾	36½	36⅞	37¼	37¾	37¾	37¾	37⅜	38⅞	38¾	38¾	39¼	39⅜	38⅞	39	39¼
Rolled brown	35⅛	35	34½	34⅝	34⅞	34⅜	....	35⅜	35½	35⅛	35¾	36⅛	36	36½	36¾	36⅝	38	37⅞	37¾	37⅞	38⅛	37¾	38	38

*Holiday.

March 2. Spot No. 1 rolled brown crêpe, 36 cents; Mar., 35¾-35⅞ cents; Apr.-June, 35¾ cents; July-Sept., 35½-35⅝ cents; Oct.-Dec., 35⅜-35½ cents.

March 24. Spot No. 1 roll brown crêpe, 41 cents; April, 42¼ cents; May-June, 39 cents; July-Sept., 39 cents.

SOUTH AMERICAN PARAS AND CAUCHO. March 2, Spot, upriver fine, 31½-31¾ cents; islands fine, 30½-30¾ cents; upriver coarse, 26½ cents; Cametá, 16 cents; caucho ball, 26¾ cents.

March 24. Spot, upriver fine, 36¼ cents; islands fine, 34 cents; upriver coarse, 29½ cents; Cametá, 31 cents; caucho ball, 30-31¾ cents.

London

The London market for March began with a stiffening of prices and was very active around the first, sagging later in the week from lack of New York support. The succeeding week was equally firm and prices were well maintained at around 19½ pence and conditions generally quiet. The third week the market continued to advance, the price early in the week reaching 19⅞ pence, which was highest since September, 1920, and the week closed with rubber very firm at 20 pence and rising, reaching 20⅜ pence early the following week, with trade quiet.

London stocks have continued to decline and are evidently destined to continue further toward the vanishing point. The record of weekly stocks is as follows: February 24, 23,255 tons; March 3, 25,003 tons; March 10, 21,639 tons; March 17, 20,534 tons; March 24, 18,934 tons.

Singapore

The month's market in Singapore closely reflected London and New York conditions, rising from 17⅞ pence March 2 to 19¼ pence March 24. Active conditions early in the month were succeeded by increasing steadiness, with firm and advancing prices. Shipments and offerings were reported few.

New York Quotations

Following are the New York spot rubber quotations, for one year ago, one month ago, and March 24, the current date:

	March 25, 1924	February 24, 1925	March 24, 1925
Plantation Hevea			
Rubber latex (Hevea), *per gal.*	$1.30 @	$1.25 @	$1.50
CREPE			
First latex	.22¾@.23	.37⅜@.37⅝	.43¾@
Off latex	.22½@.22¾	.37 @	.43½@
Amber No. 2	.22 @.22¼	.36¼@	.42½@
Amber No. 3	.22 @	.36 @	.42¼@
Amber No. 4	@	.34¾@	.42¼@
Brown, clean, thin	.22 @	.36⅛@	.42¼@
Brown, specky	.21¼@.21¾	.35¾@	.42 @
Brown, roll	.21¾@.22	.34¾@	.41 @
Sole crêpe	@	.47 @.48	@
SHEET			
Smoked, ribbed	.22¼@.22½	.37⅛@	43 @
East Indian			
PONTIANAK			
Banjermassin	.06¾@.07½	.08½@	.07½@.08
Palembang	.07¼@	@	.08 @
Pressed block	.13¼@.13¾	.14 @	.13 @.13½
Sarawak	.07 @	.07¼@	.07 @
South American			
PARAS			
Upriver, fine	.18½@	.32 @	.36¼@
Upriver, fine	*.28½@	*.43½@	*.47¾@
Upriver, medium	.17 @.17¾	.30½@	.34½@
Upriver, coarse	.15½@.16	.26¾@	.29½@
Upriver, coarse	*.25¾@	*.36¾@	*.40 @
Islands, fine	.16 @.17	.30 @	.34 @
Islands, medium	@	.28 @	@
Islands, coarse	.10½@	.25½@	@
Cametá	†.11½@.12	.25½@	@
Acre Bolivian, fine	.19 @.19¼	.32 @	.36¾@
Acre Bolivian, fine	*.28½@.29	*.43¾@	*.48 @
Beni Bolivian	.19¼@.19½	.32¼@	.37 @
Madeira, fine	.19½@	.33 @	.37½@
Peruvian, fine	.17 @.17¼	.30 @	@
Tapajos, fine	.17½@.17¾	.31 @	@
CAUCHO			
Upper caucho ball	.16½@.16¾	.27 @	.31¾@
Upper caucho ball	*.26 @	*.36¼@	*.40¼@
Lower caucho ball	.15 @.15½	.25½@	.30 @
Maniçobas			
Ceará negro heads	.20 @	.24 @	.28 @
Ceará scrap	.08 @	.10 @	.16 @
Maniçoba 30% guaranty	.18 @	.26 @	.27 @
Mangabeira, thin sheet	.23 @	.27 @	.29 @
Centrals			
Central scrap	.16½@	.25 @	.32 @
Central wet sheet	.14 @	@	.22 @
Corinto scrap	.16¼@	.26¼@	.32 @
Esmeralda sausage	.16½@	.26 @	.32 @
Guayule washed and dried	.23½@	.32 @	.35 @
Africans			
Black Kasai	.19 @	24 @	.37½@
Black Upper Congo	.19 @	@	.37½@
Red Upper Congo	.20 @	@	.32½@
Kasai Loanda	@	@	.33½@
Upper Congo Arumimi	@	@	.35 @
Gutta Percha			
Gutta Siak	.17¼@	.18¼@	.17½@
Gutta Soh	.32 @	.28 @	.28 @
Red Macassar	3.00 @	3.25 @	3.00 @
Balata			
Block, Ciudad Bolivar	.66 @	.61½@	.70 @
Colombia	.57 @	.50½@	.56 @
Panama	.56 @	.50½@	.55 @
Surinam, sheet	.73 @	.77 @	.78 @
amber	.76 @	@	.81 @
Chicle			
Honduras	@	.58 @.68	.58 @.68
Yucatan, fine	@.68	.58 @.68	.58 @.68

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

Comparative Low and High New York Spot Rubber Prices

	March 1925*	March 1924	March 1923
PLANTATIONS			
First latex crêpe	$0.38¼@$0.43¾	$0.20¾@$0.25½	$0.33½@$0.36¼
Smoked sheet, ribbed	.38⅛@ .43	.20⅜@ .24¾	.33½@ .36¼
PARAS			
Upriver, fine	.31½@ .36¼	.18¼@ .20½	.30¼@ .34
Upriver, coarse	.26½@ .29½	.15⅜@ .17¼	.26½@ .28½
Islands, fine	.30½@ .34	.15 @ .18¾	.28½@ .32
Islands, coarse		.09½@ .11	.15 @ .26
Cametá	.16 @ .17	.10½@ .11½	.14 @ .17

* Figured to March 24, 1925.

British Malaya

Rubber Exports in February

An official cablegram from Singapore to the Malay States Information Agency, London, states that the rubber exported from British Malaya in February totaled 21,622 tons. The amount of rubber imported was 10,071 tons, of which 8,141 tons were declared as wet rubber.

The following are comparative statistics:

	1924		1925	
	Gross Exports, Tons	Foreign Imports, Tons	Gross Exports, Tons	Foreign Imports, Tons
January	23,844	8,867	19,183	10,132
February	19,395	7,440	21,622	10,071
Totals	43,239	16,307	40,805	20,203

Distribution

DESTINATION	January, 1925 Tons	February, 1925 Tons
United Kingdom	1,435	2,971
United States	14,807	15,240
Continent of Europe	1,904	2,204
British Possessions	421	610
Japan	611	564
Other foreign countries	5	33
Totals	19,183	21,622

Dealers' Stocks of Rubber

The Malay States Information Agency, 88 Cannon Street, London, E. C. 4, Eng., has received a cable stating that dealers' stocks of rubber in Singapore on the 31st January last amounted to 13,816 tons and in Penang to 2,109 tons.

AMERICAN EXPORTS OF TIRE REPAIR MATERIALS SHOWED A COMparatively steady increase in value throughout the past year, the total for this period standing at $521,351, as compared with $310,034, the estimate for the year 1922.

Reclaimed Rubber

During the past month reclaimers have been shipping their products in steady volume to rubber goods manufacturers. Reclaiming plants generally are operating at or near capacity, largely, however, on old orders. March business has shown a normal tonnage output.

The increased manufacture of rubber tile flooring is a growing outlet for reclaims in addition to the old ones in mechanical rubber goods, heels, etc. The market list is quoted unchanged from the figures given a month ago, regardless of the marked rising tendency in crude rubber.

New York Quotations

March 24, 1925

Auto Tire			
Black	lb.	$0.08¾ @	$0.09
Black, washed	lb.	.10¼ @	.10¾
Dark gray	lb.	.09¾ @	.10
Light gray	lb.	.11½ @	.12
White	lb.	.14½ @	.15
High Tensile Black			
Super-reclaim, No. 1	lb.	.17 @	.17¼
No. 2	lb.	.12 @	.13
Shoe			
Unwashed	lb.	.09 @	.09½
Washed	lb.	.12½ @	.12¾
Tube			
No. 1	lb.	.14½ @	.15½
No. 2	lb.	.11½ @	.12½
Uncured Tire Friction			
No. 1	lb.	.27 @	.30
No. 2	lb.	.22 @	.24
Miscellaneous			
High grade, red	lb.	.14 @	.14¼
Truck tire	lb.	.09 @	.09½
Mechanical blends	lb.	.06¼ @	.07

Plantation Rubber Exports from Dutch East Indies

Java and Madura

	December		Twelve Months Ended December	
	1923 Kilos	1924 Kilos	1923 Kilos	1924 Kilos
To—				
Holland	204,000	330,000	2,863,000	3,435,000
Great Britain	655,000	709,000	5,734,000	7,059,000
Germany	23,000	46,000	329,000	406,000
France	4,000	6,000	442,000	259,000
Belgium	.....	.....	17,000	25,000
Italy	23,000	27,000	288,000	365,000
Canada	.....	.....	54,000	4,000
United States	2,508,000	3,132,000	22,028,000	27,967,000
Singapore	156,000	445,000	1,537,000	2,831,000
Hongkong	.....	.....	.....	27,000
Japan	202,000	3,000	601,000	754,000
Australia	.....	4,000	185,000	251,000
Other countries	.....	8,000	.....	8,000
Totals	3,755,000	4,710,000	34,078,000	43,391,000
Tandjoenpriok	1,836,000	1,709,000	14,374,000	16,624,000
Tjerebon	.....	.....	70,000	73,000
Samarang	238,000	269,000	2,339,000	3,049,000
Sourabaya	1,175,000	2,239,000	12,792,000	17,546,000
Pasuruan	161,000	84,000	1,204,000	1,311,000
Probalingga	97,000	75,000	743,000	1,279,000
Panarukan	136,000	128,000	1,192,000	1,462,000
Banjuwangi	44,000	73,000	809,000	926,000
Tjilatjap	88,000	133,000	547,000	1,118,000

Belewan-Deli

Holland	115,000	123,000	1,828,000	1,697,000
Great Britain	445,000	701,000	4,214,000	5,601,000
Germany	5,000	63,000	200,000	474,000
France	13,000	8,000	417,000	256,000
Belgium	.....	.....	204,000	27,000
Italy	4,000	.....	335,000	222,000
United States	3,108,000	2,782,000	27,754,000	30,391,000
Singapore	172,000	100,000	2,421,000	952,000
Straits Settlements	.....	.....	152,000	.....
Penang	61,000	140,000	615,000	1,097,000
Australia	3,000	10,000	4,000	34,000
Other countries	10,000	12,000	34,000	142,000
Totals	3,936,000	3,939,000	38,178,000	40,893,000

The Market for Rubber Scrap

Trade in rubber scrap in March was very slow and dull, reclaimers not being interested on account of their ample reserve stocks. The rise in crude rubber prices will probably find some reflection in reclaims and scrap and stimulate these lines accordingly.

Rubber scrap prices are quoted unchanged from a month ago; however, the outlook is considered hopeful for better prices in the near future.

BOOTS AND SHOES. There has been very little trade in this grade. Dealers' bids have fallen to $1.75 delivered to reclaiming points, without stimulating demand.

INNER TUBES. Prices remain steady and low. Domestic and foreign trade in tubes are both moderate.

MIXED TIRES. Tires are not moving well. All orders are filled at bottom prices and dealers' bids are of little interest.

AIR BRAKE AND MECHANICAL SCRAPS are without market demand.

Consumers' Quotations for Carload Lots Delivered

March 24, 1925

Boots and Shoes			
Boots and shoes, black	lb.	$0.02½ @	$0.02½
Trimmed arctics, black	lb.	.01¾ @	.02
Red and white	lb.	.01 @	.01¼
Untrimmed arctics	lb.	.01¼ @	.01⅜
Hard Rubber			
Battery jars, black compound	lb.	.01 @	—
No. 1 scrap	lb.	.05 @	.06
Inner Tubes			
No. 1 floating	lb.	.06¼ @	.06½
No. 2 compounded	lb.	.04 @	.04¼
Red	lb.	.03¼ @	.03½
Mechanicals			
Black scrap, mixed	lb.	.01½ @	.01¾
Heels	lb.	.00¾ @	—
Horseshoe pads	lb.	.01 @	—
Hose, air brake	ton	20.00	@22.00
regular	ton	17.00	@20.00
Red, scrap, mixed	lb.	.02 @	—
White, scrap, mixed	lb.	.02 @	—
Tires			
PNEUMATIC			
Auto peelings	ton	50.00	@60.00
Bicycle	ton	12.00	@15.00
Standard white auto, with beads	ton	30.00	@35.00
Mixed auto, with beads	ton	18.00	@20.00
SOLID			
Carriage	ton	25.00	@27.00
Truck, clean	ton	38.00	@40.00

U. S. EXPORTS TO ENGLAND OF RUBBER BOOTS AND SHOES

During the past year American exports to England of rubber boots and shoes have been exceptionally heavy, particularly during the last half of the period. April shipments of rubber boots at only 4,169 pairs, value $12,192, culminated in the estimate for December of 78,313 pairs, value $136,458, while the total for the entire year rose to 306,516 pairs, value $711,121. The steady development of this trade can be best indicated by comparing the totals with those for the year 1922, the latter representing only 47,691 pairs, value $93,344.

A similar advance is evident in the American exports of rubber shoes, the shipments to England for the year totaling 333,859 pairs, value $211,750, as compared with the 1922 totals of only 64,130 pairs, value $53,897. The largest monthly shipment of these goods is reported for September, at 99,173 pairs, value $66,996. In general these exports during 1924 of rubber boots were more than six times greater in quantity and more than seven times greater in value than the 1922 shipments, while the exports of rubber shoes were more than five times greater in quantity and almost four times greater in value.

The Market for Chemicals and Compounding Ingredients

New York

THE trade in rubber compounding ingredients maintained a large and steady volume during March, due to the full time operation of rubber plants in all divisions of the industry. The large suppliers of materials report no diminution in the demand for their goods nor the receipt of any requests for deferred shipments on contracts.

ACCELERATORS. The original accelerators, aniline, thiocarbanilide and hexamethylene tetramine still maintain their places of usefulness and continue to be steadily used in large amounts in spite of the increasing popularity of some of the later and more active accelerators. Hexa, for example, is still being supplied in carload lots. A new line of ultra accelerators, metallic salts of dithiocarbamic acid, now under development and test, is reported as producing stocks of remarkably high tensile qualities and will doubtless meet with much interest when offered to rubber manufacturers.

BENZOL. Adequate stocks are reported on hand, and the demand is excellent notwithstanding an advance of 1 cent a gallon early in March.

CARBON BLACK. The curtailment in Louisiana of natural gas available for carbon black manufacture has strengthened the market. Stocks are fairly large. Prices remain steady and the demand from the rubber trade is fair.

CLAYS. Specially prepared clays suitable for stiffening rubber have become standard as cheap and useful material in tire treads and beads, footwear, mechanical rubber goods, heels and molded goods.

LITHARGE. Lead pigments and oxides were reduced ¼ of a cent a pound early in March due to reduction in pig lead. Movement of litharge and sub-lead is steady.

SOLVENT NAPHTHA. The supply is of moderate volume and consuming demand very good.

WHITING. All grades are in routine movement at low prices.

New York Quotations

March 24, 1925.

Accelerators, Inorganic

Lead, carbonate	*lb.*	$0.11¼	@
Lead, red	*lb.*	.13	@
sublimed blue	*lb.*	.10¾	@
sublimed white	*lb.*	.10¾	@
Lime, flour	*lb.*		@
R. M. (factory)	*lb.*	.01¼	@
R. M. hydrated	*ton*	15.00	@
superfine	*lb.*	.01½	@ 0.02
Litharge	*lb.*	.12½	@
Magnesia, carbonate	*lb.*	.07¾	@
calcined, light (bbls.)	*lb.*	.24	@ .45
calcined, ex. light (bbls.)	*lb.*	.40	@
calcined, md. light (bbls.)	*lb.*	.15	@
calcined, heavy (bbls.)	*lb.*	.04	@ .05
magnesium, carbonate, light,	*lb.*	.07	@
Orange mineral A.A.A	*lb.*	.16	@
Rubber lead	*lb.*	.10	@

Accelerators, Organic

A-7	*lb.*	.75	@ .85
A-19	*lb.*	.85	@ .95
Accelemal	*lb.*	.30	@
Aldehyde ammonia powder	*lb.*	.95	@
Anhydro formaldehyde aniline	*lb.*	.38	@
Anhydroformaldehyde-para-toluidine	*lb.*	1.11	@
Aniline (factory)	*lb.*	.17	@ .17½
sulphate	*lb.*		@
Benzidine (base)	*lb.*	.75	@ .78
Benzyl aniline	*lb.*	.55	@
Cryline	*lb.*	.60	@
paste	*lb.*	.60	@
powder	*lb.*	.35	@
D. P. T. salt	*lb.*	.92	@
Diethyl amine	*lb.*	2.20	@
Dimethyl amine	*lb.*	2.75	@
Dimethylaniline	*lb.*	.33	@ .36
Di-ortho-tolylguanidine	*lb.*	1.26	@
Di-ortho-tolythiourea	*lb.*	.32	@
Diphenyl guanidine	*lb.*	1.10	@ 1.20
Ethyl aniline	*lb.*	.70	@
Ethylidene aniline	*lb.*	.75	@
Ethyl-o-toluidine	*lb.*	.70	@
Excellerex	*lb.*	.40	@ .45
Formaldehyde aniline	*lb.*	.42½	@
Heptene	*lb.*	1.50	@
Hexamethylene tetramine	*lb.*	.85	@
Lead oleate (fac'ty)	*lb.*	.18	@
Methylene aniline	*lb.*	.40	@ .45
Methylenedianilide	*lb.*	.40	@
No. 999	*lb.*	18	@
Shawinigan paraldehyde	*lb.*	.17	@ .19
Para-nitrosodimethylaniline	*lb.*	.99	@
Paraphenylene diamine	*lb.*	1.25	@ 1.30
Quinodine	*lb.*	.40	@
Super-sulphur, No. 1	*lb.*	.50	@
No. 2	*lb.*	.20	@ .30
Tensilac No. 39	*lb.*	.80	@
No. 40	*lb.*	.75	@
Thiocarbanilide	*lb.*	.28	@ .30
Trimene	*lb.*	.75	@
Trimene base	*lb.*	1.40	@
Triphenylguanidine	*lb.*	.75	@
Tuads	*lb.*	4.50	@ 6.00
Vulcone	*lb.*	.89	@

Acids

Acetic 28% (bbls.)	*100 lb.*	$3.12	@ $3.38
glacial (carboys)	*lb.*	.16	@
Cresylic (95% straw color)	*gal.*	.62	@ .65
(95% dark)	*gal.*	.58	@ .61
Sulphuric, 66° (carboys)	*lb.*	.02	@

Alkalies

Caustic soda	*100 lbs.*	$3.10	@ 3.91
flake, 76% (factory)	*100 lbs.*	3.45	@ 4.31
solid, 76% (factory)	*100 lbs.*	3.20	@ 3.91

Colors

BLACK

A. & W. nonfli	*lb.*	.40	@
Aerfloted arrow	*lb.*	.06½	@ .10
Bone	*lb.*	.05½	@ .11
Carbon black:			
Compressed	*lb.*	.07	@ .11
Uncompressed	*lb.*	.06½	@ .10
Micronex	*lb.*	.07½	@ .12
Charcoal (pow'd)	*lb.*	.05	@ .09
Drop	*lb.*	.06	@ .10
Ivory black	*lb.*	.12	@ .30
Lampblack	*lb.*	.10	@ .12
Shawinigan	*lb.*	.12	@ .14
Thermatomic carbon (factory)	*lb.*	.04	@

BLUE

Cobalt	*lb.*	.21	@ .26
A. & W. blue	*lb.*	2.00	@ 4.00
Prussian	*lb.*	.40	@ .50
Ultramarine	*lb.*	.05	@ .35

BROWN

Iron oxide	*lb.*		@
Sienna, Italian	*lb.*	.03	@ .14
Umber, Turkey	*lb.*	.04½	@ .05

GREEN

Chrome, light	*lb.*	.29	@ .31
medium	*lb.*	.30	@ .32
dark	*lb.*	.31	@ .34
commercial	*lb.*	.10	@ .10½
tile	*lb.*	.13	@ .15
A. & W. green	*lb.*	2.00	@ 3.00
Oxide of chromium	*lb.*	.34	@ .51
T. K.	*lb.*	.40	@ .45

RED

Antimony, golden	*lb.*	.20	@
golden T. K.	*lb.*	.18	@ .22
golden R.M.P. No. 7.	*lb.*	.20	@
golden pentasulphide, T. K.	*lb.*	.33	@ .35
golden, 15/17% G. E.	*lb.*	.15	@ .18
golden, 15/17% F. S.	*lb.*	.18	@
golden, No. 1	*lb.*	.30	@
golden, No. 2	*lb.*	.20	@
Antimony, crimson	*lb.*	.42	@ .45
crimson T. K.	*lb.*	.45	@ .50
crimson, 15/17% G. E.	*lb.*	.45	@ .50
crimson, 15/17% F. S.	*lb.*	.39	@
crimson, R.M.P. No. 3	*lb.*	.50	@
crimson F.	*lb.*	.45	@
7-A	*lb.*	.35	@
Z-2	*lb.*	.20	@
Vermillon, 5% F. S.	*lb.*	.65	@

RED—*Continued*

Antimony

Vermilion 15/17% F.S.	*lb.*	$0.50	@
Arsenic, red-sulphide	*lb.*		@
A. & W. red (4 shades)	*lb.*	1.50	@ 3.00
purple	*lb.*	2.00	@ 3.00

Iron oxides

domestic	*lb.*	.12	@
English	*lb.*	.11½	@
English Indian	*lb.*	.11	@ .13
Indian, pure	*lb.*	.11	@ .13
pure bright	*lb.*	.11	@ .13
reduced	*lb.*	.07	@ .10
Spanish	*lb.*	.02½	@ .03¼
Levigated, waterfloated	*lb.*	.02¾	@ ½
Venetian	*lb.*	.02	@ .05½
Oximony	*lb.*	.13½	@
Pará toner	*lb.*	.90	@ .95
Toluidine toner	*lb.*	1.95	@ 2.25
Vermilion, English	*lb.*	1.35	@ 1.45

WHITE

Akcolith	*lb.*		@
Albalith	*lb.*	.06½	@ .06½
Aluminum bronze	*lb.*	.60	@ 1.25
Lithopone	*lb.*	.05¼	@ .06
Sterling	*lb.*	.06½	@ .06½
Azolith	*lb.*	.06½	@ .06½
Imported prime	*lb.*	.06½	@ .07
Red seal, imported	*lb.*		@
T. O. pigment	*lb.*	.15	@ .17
Zinc oxide			
AAA, lead free	*lb.*	.08	@ .08¼
Azo (factory):			
ZZZ (lead free)	*lb.*	.07¼	@ .08¼
ZZ (5% leaded)	*lb.*	.06¾	@ .07¼
Z (8.10% leaded)	*lb.*	.06¾	@ .07¼
French process, Florence brand			
Green seal	*lb.*	.10¾	@ .11½
Red seal	*lb.*	.09¾	@ .10½
U. S. P.	*lb.*	.14½	@ .16½
White seal	*lb.*	.11¾	@ .12½
Horse Head brands			
Selected	*lb.*	.08½	@ .08¾
Special	*lb.*	.08½	@ .08¾
XX red	*lb.*	.08	@ .08¼
Leaded brands			
Lehigh	*lb.*	.07½	@ .07¾
Standard	*lb.*	.07½	@ .07¾
Sterling	*lb.*	.07½	@ .07¾
Superior	*lb.*	.07¾	@ .07¾
Palmerton process			
Kadox, black	*lb.*	.10¾	@ .11¼
blue	*lb.*	.09¾	@ .10¼
red	*lb.*	.08¾	@ .09¼
Snow white	*lb.*		@

YELLOW

Arsenic	*lb.*	.65	@ .75
Chrome	*lb.*	.18	@ .21
A. & W. yellow	*lb.*	2.50	@ 4.00
India rubber	*lb.*	.75	@
Ochre, domestic	*lb.*	.03	@ .03½
imported	*lb.*	.02	@ .02½

Chemical Market—*Continued*

New York Quotations

March 24, 1925.

Compounding Ingredients

Aluminum flake (sacks C.L.)	ton	$21.85	@
(sacks L. C. L.)	ton	24.50	@
Ammonia carbonate	lb.	.12	@ .12½
Asbestine	ton	13.00	@25.00
Aluminum silicate	ton	25.00	@27.00
Barium, carbonate (bbl.)	ton	53.00	@54.00
dust	lb.	.05	@
Barytes, imported white	ton	32.00	@35.00
pure white	ton	30.00	@35.00
O.C.X., off color	ton		@
water ground and floated	ton	23.00	@26.00
Basofor	lb.	.04½	@
Blanc fixe	lb.	.04	@ .04½
Carrara filler (factory)	lb.	.01¼	@ .02
Chalk, precip. extra light	lb.	.04¼	@ .05
heavy (f.o.b. factory)	lb.	.03¼	@ .04
Clay, Dixie	ton	20.00	@35.00
Blue ribbon (C. L. facty.)	ton	14.00	@
Blue Ridge	ton	12.00	@24.00
Catalpo (facty.)	ton	38.00	@40.00
China	lb.	.01½	@
China, L. H. B.	ton	13.00	@22.50
English, L. H. B.	lb.	.02½	@ .02¼
Langford	ton	12.00	@22.00
Cotton flock, black	lb.		@
light-colored	lb.		@
white	lb.		@
Cotton linters clean mill-run	lb.	.04½	@
Fossil flour (powdered)	ton		@
(bolted)	ton		@
Glue, high grade	lb.	.21	@ .29
medium	lb.	.19	@ .25
low grade	lb.	.14	@ .18
Graphite, flake	lb.	.06½	@ .12
Infusorial earth (pow'd)	lb.	.03½	@
(bolted)	ton		@
Lime (bolted)	lb.	.01½	@ .02
Mica, amber	lb.	.05	@
powdered	lb.		@
white	lb.		@
Pumice stone, powd.	lb.	.03	@ .05
Rotten stone (bbls.)	lb.	.02½	@ .04½
Slate flour (facty.)	ton	8.50	@15.00
Soap bark, cut	lb.	.09½	@ .10
Soapstone	ton	15.00	@25.00
Sodium bicarbonate (bbls.) 100 lbs.		2.00	@
Starch, powd. corn			
Buffalo (bbls.) 100 lbs.		4.34	@ 4.54
(bags) 100 lbs.		4.07	@ 4.27
Talc, soapstone	ton	15.00	@20.00
Terra blanche	ton	23.00	@25.00
Whiting, domestic No. 33	ton	10.00	@
chalk, L. H. B.	ton	16.00	@25.00
commercial (facty.) 100 lbs.		.90	@ 1.00
English, imported	lb.	.01¼	@
English, cliffstone (factory) 100 lbs.		1.60	@ 2.50
Georgia calcite	ton		@
gilders (bolted) 100 lbs.		1.25	@ 1.35
Nelco	ton	11.00	@22.50

Perfection	ton	$13.00	@$15.00
Quaker	ton	13.00	@15.00
Snowflake white	ton		@
Superfine	ton		@
Sussex	ton	8.00	@10.00
Witco (C. L.)	ton	12.00	@
York	ton	8.00	@
Wood pulp, XXX (facty.)	ton	35.00	@
X (facty.)	ton	25.00	@

Mineral Rubber

Genasco (facty.)	ton	50.00	@52.00
Gilsonite	ton		@
Granulated M. R.	ton	35.00	@45.00
Hydrocarbon, hard	ton	29.00	@35.00
Hydrocarbon, soft	ton	29.00	@35.00
Mineral Flour	ton	17.00	@
Ohmlac Kapak, K-R	ton	30.00	@60.00
K-4	ton	175.00	@
320/340 m. p. hydrocarbon	ton	47.00	@52.00
300/310 m. p. hydrocarbon	ton	42.00	@47.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R., solid, (facty.)	ton	35.00	@75.00
M. R. (gran. facty.)	ton	42.00	@80.00
Paradura	ton	60.00	@62.50
Rubrax (facty.)	ton	60.00	@
Synpro, gran. M. R. (facty.)	ton		@

Resins and Pitches

Tar, pine, retort	bbl.	13.50	@14.00
kiln	bbl.	13.50	@15.00
Pitch, Burgundy	lb.	.06	@
coal tar	ton	30.00	@
Fluxol hardwood	lb.	.02	@ .03
pine tar	bbl.	6.50	@
ponto	bbl.	6.50	@
Rosin, K (bbl.) 280 lbs.		8.90	@
strained (bbl.) 280 lbs.		8.75	@
Shellac, fine orange	lb.	.66	@ .68
substitute	gal.	1.50	@
Peanut, crude	lb.	.13	@
refined	lb.	.16½	@ .17
Petrolatum, standard	lb.	.06	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.65	@ .68
Rapeseed, refined	gal.	.92	@ .93
blown	gal.	1.05	@
Rosin	gal.	.49	@ .50
Soya bean	lb.	.13½	@
Tar	gal.	.28	@ .33
Woburn	lb.	.05	@

Oils (Softeners)

Avoilas compound	lb.	.12	@ .13
Castor, No. 1, U. S. P.	lb.	.17½	@
No. 3, U. S. P.	lb.	.17	@
Corn, crude (bbls.)	lb.	.12	@
Cotton, Summer yellow	lb.	.12	@

Oils (Softeners)—*Continued*

Cycline	gal.	$0.35	@$0.38
Glycerine	lb.	.19	@ .19¼
Linseed, raw	gal.	1.09	@ 1.12
Liquid rubber	lb.	.11	@
Palm lagos	lb.	.09½	@ .09¾
clarified	lb.	.09½	@ .10
Palm, niger	lb.	.09¼	@
Parra M. R. flux	lb.	.06	@ .07

Solvents

Acetone (98.99%, [6.62 lbs. gal.])	lb.	.10	@ .11
Benzol (90%, 7.21 lbs. gal.) pure	gal.	.24	@ .29
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	lb.	.06¼	@
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	lb.	.07½	@ .08
Gasoline			
No. 303			
Tankcars	gal.	.22	@
Drums, C. L.	gal.	.25	@
Drums, L. C. L.	gal.	.28	@
Motor gas (steel bbls.)	gal.	.20	@
Naphtha, V. M. & P.	gal.	.20½	@
68° Bé., 122°, 324°	gal.	.18½	@
70° Bé., 114°, 314°	gal.	.19½	@
71° Bé., 112°, 304°	gal.	.20½	@
Turpentine, spirits	gal.	.94½	@
wood, steam distilled	gal.	.84	@

Substitutes

Black	lb.	.08	@ .14
Brown	lb.	.10	@ .14
White	lb.	.09	@ .16
Brown factice	lb.	.09	@ .18
White factice	lb.	.09	@ .16

Vulcanizing Ingredients

Black hypo	lb.	.18	@
13% P. S.	lb.	.20	@
Ethyl chloride (drums)	lb.	.24	@
Sulphur chloride (drums)	lb.	.04½	@
Sulphur, Bergenport brand, 100% pure (C.L.) 100 lbs.		2.35	@ 2.60
(L.C.L.) 100 lbs.		2.65	@ 2.90
Sulphur, Brooklyn brands			
Refined velvet (bbls.) 100 lbs.		2.90	@ 3.15
(bags) 100 lbs.		2.65	@ 2.90
Superfine flour (bbls.) 100 lbs.		2.60	@ 2.90
(bags) 100 lbs.		2.20	@ 2.50
Rubber makers 100 lbs.		3.75	@

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.55	@ .65
ceresine, white	lb.	.10	@ .11
carnauba	lb.	.35	@ .37
montan	lb.	.06	@ .06½
ozokerite, black	lb.	.24	@ .25
green	lb.	.26	@ .30

Paraffin

122/124 white crude scale	lb.	.05½	@
124/126 white crude scale	lb.	.05⅝	@
120/122 fully refined	lb.	.05½	@
125/127 fully refined	lb.	.05⅝	@

D. P. G. SALT

D. P. G. salt is a form of diphenyl guanidine produced by a new method. It affords a marked saving in cost, is used in the same proportions and gives results identical with those obtainable by D. P. G. itself.

WEEPING WATER WHITING

A soft whiting of uniform fineness, color and physical and chemical characteristics is being mined and specially prepared for rubber compounding in a plant equipped with the most modern and efficient machinery. The process is under positive control and yields a product of unusually small particle size and freedom from alkalinity.

EXPORTS OF COMPOUNDING INGREDIENTS

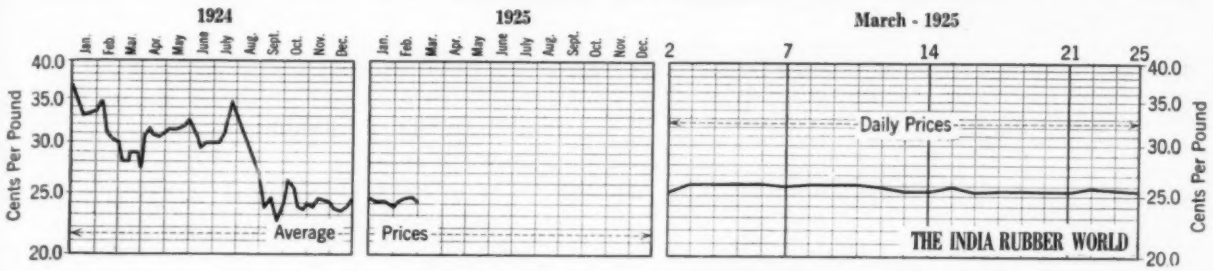
American exports during 1924 of compounding ingredients were as follows: Zinc oxide, 7,854,394 pounds, $605,630; lithopone, 1,845,073 pounds, $104,783; bone black, 1,971,857 pounds, $123,201; carbon and lampblacks, 34,428,855 pounds, $3,385,852; red lead and litharge, 1,880,263 pounds, $210,598; white and sublimed lead, 10,109,455 pounds, $853,444.—*Commerce Reports.*

GRAY LITHARGE

A new form of litharge for use in rubber compounding is now being produced on a commercial basis in Germany. The material is known as gray litharge. It is amorphous, of extremely fine particle size and correspondingly great specific surface. The adsorptive power of the material allows it to be completely dispersed in rubber. The physical properties of the vulcanized product containing gray litharge are said to exceed in a remarkable degree those obtained with ordinary litharge. By the use of gray litharge, scorching of batches in mixing, calendering and tubing is avoided due to the slower beginning of its curing reaction.

M. I. T. RESEARCH LABORATORY OF APPLIED CHEMISTRY

Special graduate courses are offered by the Massachusetts Institute of Technology, Boston, Massachusetts, to students interested in applied chemistry. The well-equipped research laboratory, first established in 1909, was reorganized on a much larger basis in 1919, and was fitted out for independent investigations in major branches of chemical technology. In the various courses which include colloid chemistry, rubber, etc., young men are being trained in applied science by actual experience.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. Spot middlings maintained for the month an average level of more than one cent over that for February, fluctuating closely between its high and low. Apparently trade demand fell off above 26 cents for the old crop and 25½ cents for the new.

The probable acreage for the new season has not yet been determined. The impression is that there will be a small increase in some eastern belt sections and a larger increase in the western belt. The present outlook for the new crop is not regarded as promising. Excess of rains prevail over the central and eastern belt, while Texas, the most important state, is suffering from a prolonged drought. Freaky conditions of weather have been widespread and should rains soon occur in Texas most perfect climatic conditions during the whole season would be required to produce a good yield. Climate rather than acreage is the more important factor determining yield.

ARIZONA COTTON. Pima cotton has practically all been taken by spinners, the stock outside of mill hands being chiefly weak staple. Sea Islands have practically disappeared from the market.

EGYPTIAN COTTON. There has been very little change the past month in the long staple situation. Egyptian Sakel continues to maintain its strength, there being no limit to which prices can be pushed if the holders of the actual cotton are so inclined. Top grades of this growth have been quoted recently as high as 90 cents and are now, March 21, only 2 or 3 cents cheaper. Medium grades are being sold in small lots around 75 cents. Egyptian Uppers are steady, around 43 to 45 cents for medium to good grade cotton. The stock now of this growth is essentially all medium and low grades. Top grades are practically unobtainable.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market is gradually assuming increased activity under the stimulus of a better demand for deliveries over the second quarter of the year, and the growing firmness in the cotton staple market. A good steady business in ducks, drills and osnaburgs is anticipated.

RAINCOAT FABRICS. Business has improved the past month but volume is still lacking, due to uncertainties as to styles.

SHEETINGS. The market is fairly firm but sales are very light to meet current needs only. The light weight cloths have been moving better than the heavier ones, but hand-to-mouth purchasing is expected to continue for an indefinite period.

TIRE FABRICS. Early in the month tire fabrics were somewhat neglected because the tire companies were very well stocked for spring production needs. Many eastern fabric mills were quiet, while those in the South were busy, with orders ahead covering 4 months' business. Inventory statistics indicate that the January consumption of tire fabrics totaled 12,310,822 pounds.

While comparatively little new business developed early in the month, considerable interest was shown later in July-September commitments. Sales on contract for the third quarter have been made for full requirements and fairly satisfactory business was done, orders coming in fair volume from both large and small companies. Evidently the tire companies have decided that the present is a good time to average purchases.

New York Quotations

March 24, 1925

Drills

38-inch 2.00-yard	yard	$0.22 @
40-inch 3.47-yard		.12⅞ @
52-inch 1.90-yard		.23¼ @
60-inch 1.52-yard		.29½ @

Duck

38-inch 2.00-yard	yard	.23¼ @
40-inch 1.47-yard		.31¾ @
72-inch 16.66-ounce		.53½ @
72-inch 17.21-ounce		.54⅞ @

MECHANICAL

Hose and belting	pound	.45 @
Specials		.49 @

TENNIS

52-inch 1.35 yard	yard	.35⅞ @

Hollands

DEAD FINISH

Standard, 37-inch	yard	.19½ @
42-inch		.23½ @

FLAT FINISH

Imperial, 36-inch		.15½ @
40-inch		.17½ @

RED SEAL

36-inch		.18 @
40-inch		.19 @
50-inch		.30 @

GOLD SEAL

40-inch		$0.29 @

Osnaburgs

40-inch 2.35-yard	yard	.19⅝ @
40-inch 2.48-yard		.18⅝ @
40-inch 3.00-yard		.15⅜ @
37-inch 2.42-yard		.19 @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	.13½ @
Bombazine 60 x 48		.12½ @
Plaids 60 x 48		.13 @
Plaids 56 x 44		.12½ @
Surface prints 60 x 48		.13½ @
Surface print 64x60		.14½ @

Sheetings, 40-inch

40 x 48, 2.50-yard	yard	.16¼ @
48 x 48, 2.85-yard		.14¼ @
64 x 68, 3.15-yard		.14⅝ @
56 x 60, 3.60-yard		.12¼ @
48 x 44, 3.75-yard		.11½ @

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	$0.09 @
40 x 40, 6.15-yard		.07½ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	pound	.75 @
Peeler, karded		.52 @

CORD 23/5/3

Egyptian, combed	pound	.80 @
Egyptian, karded		.75 @
Peeler, combed, 1 1/16-in.	pound	.75 @
Peeler, karded		.54 @

CORD 13/3/3

Peeler, karded	pound	.51 @

LENO BREAKER

8-oz. Peeler, karded	pound	.52 @
10-oz. Peeler, karded		.52 @

CHAFER

8.25-oz. Peeler, karded	pound	.60 @
9.5-oz. Peeler, karded		.60 @
12-oz. Peeler, karded		.56 @
14-oz. Peeler, karded		.54 @

The Cotton Outlook

Total American Cotton Crop 13,618,751 Bales

COTTON production in the United States for the 1924-25 season amounted to 13,618,751 equivalent 500-pound bales, exclusive of linters, the Census Bureau announced in its final ginning report of the season. The production by states follows:

Alabama, 985,221; Arizona, 107,575; Arkansas, 1,097,459; California, 77,798; Florida, 18,961; Georgia, 1,003,664; Louisiana, 490,505; Mississippi, 1,098,276; Missouri, 187,051; New Mexico, 55,200; North Carolina, 823,278; Oklahoma, 1,409,175; South Carolina, 806,065; Tennessee, 356,161; Texas, 4,951,999; Virginia, 38,301; all other states, 12,062.

The 1924 crop expressed in running bales, counting round as half bales, was 13,630,608, compared with 10,170,694 in 1923 and 9,729,306 in 1922. The 1923 crop in equivalent 500-pound bales was 10,139,671 and the 1922 crop 9,762,069.

Included in the figures for 1924 are 18,838 bales which ginners estimated would be turned out after the March canvass. Round bales included numbered 314,309 for 1924; 242,307 for 1923, and 172,182 for 1922. American Egyptian cotton included was 4,319 bales for 1924; 22,426 for 1923; and 32,824 for 1922.

Linters produced from the 1924 crop to the close of February amounted to 722,686 equivalent 500-pound bales, compared with 555,972 produced to that time from the 1923 crop.

The Passing of Sea Island Cotton

Only five bales of Sea Island cotton, once considered essential to the manufacture of tire fabrics, had been ginned from the 1924 crop prior to January 16. This infinitesimal ginning marks the disappearance of the Sea Island crop from the United States. Boll weevil ravages have been the cause. The warm, humid climate of the growing region has been particularly favorable to the insect, especially as the Sea Island plant is a late maturing species with heavy foliage producing a dense shade in the field. The only hope of reviving the Sea Island industry in the United States lies in the possible success of the Department of Agriculture in its attempts to develop quicker fruiting strains.

The original home of this type of cotton, the West Indies, is still producing a small quantity, estimated in 1924 by the Department of Commerce at 6,200 bales.

World Cotton Consumption

The International Federation of Cotton Spinners estimates world consumption of American cotton for the six months ended January 31, 1925, at 6,232,000 bales. If this rate is maintained the total for the year will be 12,464,000 bales against 11,088,000 in 1923-24. Consumption of all kinds of cotton for the first half year was 11,177,000 bales, against 9,989,000 the year previous, or at the rate of 22,354,000 bales for the year, against 20,404,000 in 1923-24. Cotton stocks held by mills showed substantial increase, American descriptions on February 1, 1925, totaling 2,324,000 bales, against 1,324,000 on August 1, 1924. Cotton stocks of all kinds held by spinners on February 1 totaled 3,905,000 bales, against 3,569,000 on August 1, 1924.

Universal Cotton Standards Accepted

European and American cotton association representatives, in conference with Department of Agriculture officials on March 12, signed certificates accepting the department's copies of the universal standards for white cotton.

Representatives of the Liverpool Cotton Exchange and the Federation of Master Cotton Spinners' Association, of Manchester, England, who previously announced that they would withdraw from the agreement under which the standards are effective, also signed the certificates conditionally upon acceptance of proposed changes to establish the standards for two-year periods instead of one, and giving the conference power to alter copies should they deteriorate.

Market and Crop Prospects for 1925

John A. Todd, the well-known British cotton statistician, summarizes the outlook succinctly as follows:

The season of 1924-25 began with the smallest carryover on record. It has had the advantage of the biggest crop since the war, and yet it bids fair to add not much more than half a million bales to that minimum carryover. That means that the prospect of cotton at a reasonable price during the 1925-26 season lies entirely at the mercy of the 1925 crop. If that crop should prove to be materially less than that of 1924 the world would again be faced with a comparative shortage of American cotton.

Consideration is already being given the new crop outlook, which, on the whole, is none too favorable. Whereas last season there was an abundance of rainfall during the fall and winter, this season there has been a prolonged drought. In Texas, the biggest cotton producing state, the shortage of rainfall is very close to 60 per cent and relief from the drought now would delay planting operations. Reports from the lower Rio Grande Valley indicate that, while considerable cotton has been seeded, there is delayed germination because of the deficiency of moisture. Farm work has made very satisfactory progress, however, in Oklahoma and in the Central Valley states, and has advanced a little better in recent weeks in the South Atlantic states.

Last season witnessed but slight damage from the weevil, but indications are that this year the activity of this pest will break all records. Unfortunately the light infestation of last year created a false idea of security, but propagation too late to damage the crop much was very heavy. Large numbers of the pests went into hibernation and owing to the mild winter a heavy survival of weevil in the lower delta region of the Mississippi Valley seems certain.

Turning to the effect of these raw cotton factors, the cotton goods market continues to show gradual improvement. Cotton cloth finishers are busier than a year ago, and mills are running at near capacity. Most cotton cloths are in strong demand with prices stiffening. Sheetings and other gray cloths are being bought more freely. Duck continues to sell at close prices due largely to the competition for any sizable business that comes into the market. Mills engaged on duck, tire fabrics, and heavy goods for general manufacturing are well occupied and there is little indication of a decline in production in these lines in the next two or three months, but with cotton rising higher prices are being asked. Mill stocks are low and some mills are quite ready to accumulate a little.

Southwest Cotton Situation

The government estimate of 229,000 bales, made on November 21, 1924, for the Southwest, including California, Arizona, and Lower California, fell 28,900 short of the total amount of 257,900 raised in that section during the 1924-25 season. This increase brings the final estimate on the crop value up to $32,500,000, or an average of 25.25 cents a pound, fully a cent more than was paid for the cotton raised in the Southern States. Scarcely 2,500 bales remained unsold by March 15.

In the San Joaquin Valley in California a considerable increase in planting is assured for 1925, growers there being encouraged not only with the better prices obtained, but with the better soil yields. Last season from 32,000 acres the crop was 37,000 bales, or an

average of nearly 1 1-7 bales to the acre, as compared with one bale to every three acres in the entire country. Acreage this year will, it is said, be increased to 75,000, the cotton area being extended as far north as Modesto, a point 50 miles higher in latitude than Washington, D. C.

In the Salt River Valley, Arizona, where long-staple American-Egyptian cotton flourishes, the area will be increased to 50,000 acres for this crop. In 1924 the acreage planted was but 14,000.

The California Cotton Growers' Association, at its March conference, indorsed proposed legislation forbidding the growing of more than one variety of cotton (acala), providing for the certification of cotton seed, and for the representation of the association in the State department of agriculture. The association is convinced that the success of the cotton industry can be assured on a large scale if growers will but confine their planting to but a single variety, and maintain the highest cultural standards, thus following the example of the well organized and prosperous citrus growers of the state.

Metal Market Review

New York

In general the metal markets remained inactive during March, although there was considerable fluctuation during the last part of the month in prime western zinc prices. Sales of tin were also larger than those of any other metal, with little variation in prices.

ALUMINUM. Somewhat better inquiry for this metal from the automotive industry is reported. Germany is now said to be substituting aluminum for much of her former consumption of other metals, utilizing at the present time one-third more aluminum than in 1913. Canada is giving more attention to this metal.

ANTIMONY. There is said to be very little consuming demand for spot or future antimony, and spot stocks are very limited. Only small tonnages of this metal are being purchased.

COPPER. This market remains dull, with little improvement in price tendencies. The March bulletin of the Copper and Brass Research Association estimates a consumption during 1924 of 165,000,000 pounds of copper and its alloys by the automotive industry, while with the growing preference for closed cars a demand for 200,000,000 pounds annually is considered by the association as not a remote possibility. Preliminary figures compiled by the Anaconda Copper Mining Co. estimate the world consumption of copper in 1924 at 1,339,286 gross tons, or 12 per cent greater in 1924 than in 1923, with 1923 20 per cent greater than 1922, and the 1922 consumption 48 per cent greater than in 1921. The United States now uses more than half of the copper produced.

LEAD. As in normal times, lead is again proving to be the most stable of metals, although prices, in common with those for other metals, continue dull. There are practically no shipments of Mexican lead to this country, although a year ago considerable quantities were arriving.

STEEL. As spring approaches there appears more life in the steel situation, the automobile demand is improving, and business seems more diversified than for a long time. February as a whole saw little, if any, decrease from the January rate in steel production, while there has been apparently only a small letdown in March. A decrease in output is however only a matter of time, as steel production since early in November is said to have run above consumption. According to export figures representing the leading steel-making nations of the world, the consumption of this metal in 1924 was still much less than in 1913.

TIN. Straits shipments for March at approximately 5,000 tons, were lighter than for some time, and the figures representing the visible supply of this metal are expected to show a decrease.

ZINC. As there is a shortage of prompt zinc, extremely low prices are not likely. Preliminary estimates of the Geological Survey place the output last year in this country of primary metallic zinc at 516,000 tons, more zinc than the country has turned out in any year except the war years 1916, 1917 and 1918. The domestic consumption is placed at 450,000 tons, or more than in any year since 1916. Figures prepared by the American Zinc Institute, not strictly comparable with those of the Survey, give production as being 535,846 tons, and domestic consumption as 572,344 tons.

Basic Metals

March 24, 1925

	Cents per pound
Aluminum, virgin, 98@99 per cent	27.00 @28.00
Antimony	14.00 @
Copper—Lake, spot	14.50 @
Electrolytic, spot	14.25 @
Casting, refinery	14.00 @
Lead, spot, New York	8.90 @ 9.00
Lead, spot, East St. Louis	8.60 @ 8.65
Nickel, ingot, pound	31.00 @32.00
Tin, spot	53.625 @
Zinc, spot, New York	7.70 @
Zinc, spot, East St. Louis	7.35 @

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSE

	Cents per pound
Bright basic	4.25 @ 4.50
Annealed soft	4.50 @ 4.75
Galvanized annealed	5.15 @ 5.40
Coppered basic	5.15 @ 5.40
Tinned soft Bessemer	6.15 @ 6.40

* Regular extras for lighter gage.

Copper Wire

Base price F. O. B. factory.

	Cents per pound
Bare copper wire	.16⅝@
No. 6 B. & S. gage	.16⅞@
No. 8 B. & S. gage	.16⅝@
No. 14 B. & S. gage	.17⅜@

SPRING MEETING OF COMMITTEE D-13

The regular spring meeting of Committee D-13, American Society for Testing Materials, was held in Providence, Rhode Island, March 6 and 7, 1925. In recognition of its tenth anniversary the committee was honored by the presence of President F. M. Palmer of the parent organization. A brief historical sketch of the committee was prepared and read by Henry L. Scott of Providence.

The following excerpts are taken from certain of the reports made by the sub-committees:

SUB-COMMITTEE III. Professor Haven, Chairman. Professor Haven hoped that eventually all testing machine dials would be calibrated up to the 45 degree swing of the pendulum. Up to 20 per cent of 45 degree maximum the dials would be left blank. He showed a dial taken from a Scott machine which was marked with red arrows to indicate the upper and lower limits of capacity as defined in the new specifications. Asked how these limits would work out on the Schopper machine Professor Haven stated that any machine whose pendulum does not exceed the 45 degree swing would be acceptable on these specifications.

SUB-COMMITTEE IV. H. E. Davis, Chairman. This sub-committee will devote its energy to the preparation of "The Manual of Test Procedure Relating to the Identification of Textile Fibers in all States from Raw Material to Fabric." W. F. Edwards stated that while there was apparently little to be developed, most of the information was scattered and it should be standardized to meet the approval of the A. S. T. M. as standard and safe procedure.

B. H. Foster of the United States Rubber Co. presented a paper entitled "Investigation of Bursting Test for Knit Fabrics and Comparison of Results with the 1 by 1 by 1 Inch Grab Test." This paper indicated that the bursting strength for knit fabrics expressed in pounds per inch of width is equal to the strength in pounds of the course direction of knit fabrics obtained by the grab test.

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth and Rubberized Fabrics Value
EUROPE												
Austria	$64	$679	.....	.....	36	$77	1,056	$1,339	1,128	$1,162	.....	$31
Belgium	6,274	1,546	$512	$3,109	348	1,265	.....	.....	.....	.....	$12	2,882
Bulgaria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Czechoslovakia	.....	540	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	7,730	754	1,245	.....	4,379	16,674	7,646	8,563	9,392	8,120	1,904	.....
Finland	945	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,722	61
France	2,327	143	2,781	12,149	.....	.....	1,930	1,046	48	96	.....	4,204
Germany	75	.....	256	.....	3,024	6,319	2,737	3,616	456	800	270	1,054
Gibralter	884	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,477
Hungary	.....	.....	.....	.....	.....	.....	31	33	.....	.....	.....	.....
Iceland and Faroe Is.	.....	.....	.....	.....	3,797	11,896	1,389	3,299	.....	.....	.....	.....
Italy	201	180	.....	17,443	.....	.....	4	3	700	1,124	.....	1,829
Latvia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	194	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, Gozo and Cyprus Is.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	148	5,632	244	.....	5,012	15,033	1,680	1,188	96	192	612	432
Norway	3,775	3,012	94	.....	1,730	5,166	5,152	5,709	1,584	1,316	1,632	1,399
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rumania	.....	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	1,007	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	229	.....	436	5,408	469	1,332	.....	.....	.....	.....	472	223
Sweden	7,029	1,490	2,056	765	4,366	12,253	.....	.....	.....	.....	3,622	35
Switzerland	1,263	25	.....	.....	96	357	996	826	1,090	917	.....	1,140
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	43,024	6,959	6,303	$6,362	96,956	180,380	7,330	5,402	6,430	4,835	4,854	12,870
Ireland	.....	102	.....	.....	850	3,002	.....	.....	.....	.....	.....	.....
Yugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$73,968	$22,078	$13,938	$95,236	121,063	$247,754	29,951	$31,024	20,924	$18,562	$17,294	$27,637
NORTH AMERICA												
Canada	$12,695	$7,447	$5,501	$4,414	3,839	$9,474	9,596	$12,507	2,112	$1,501	$1,118	$14,600
British Honduras	.....	47	46	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica	4	1,336	28	.....	.....	.....	39	27	24	51	526	.....
Guatemala	78	156	82	.....	.....	.....	22	60	2,941	1,745	761	116
Honduras	288	1,019	77	.....	.....	.....	60	46	766	712	1,863	.....
Nicaragua	108	90	97	.....	.....	.....	66	77	448	366	1,647	62
Panama	119	4,117	788	.....	.....	.....	228	220	1,329	3,110	855	.....
Salvador	1,166	149	68	.....	.....	.....	.....	.....	720	437	2,343	150
Mexico	22,514	19,544	4,278	2,207	217	520	1,981	1,596	63,251	49,825	16,179	3,757
Miquelon & St. Pierre Is.	.....	.....	.....	.....	.....	.....	1,577	519	.....	.....	.....	.....
Newfoundland and Labrador	445	551	.....	.....	1,714	4,745	8,510	7,966	120	288	160	290
Bermuda	30	24	.....	.....	25	91	35	30	482	543	170	.....
Barbados	.....	.....	51	.....	.....	.....	.....	.....	17	13	.....	180
Jamaica	50	261	61	.....	.....	.....	.....	.....	174	160	72	1,075
Trinidad and Tobago	31	8	395	.....	.....	.....	.....	.....	4,763	1,764	97	565
Other Brit. West Indies	63	306	68	.....	.....	.....	.....	.....	2,394	1,697	19	.....
Cuba	3,213	8,411	5,170	.....	78	209	4,788	2,902	86,224	54,641	9,601	5,140
Dominican Republic	143	1,427	810	.....	.....	.....	144	95	24,699	15,192	640	281
Dutch West Indies	.....	101	.....	.....	.....	.....	.....	.....	8,971	6,767	125	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70
Haiti	.....	12	297	.....	.....	.....	.....	.....	624	517	508	42
Virgin Islands of U. S.	.....	.....	105	.....	.....	.....	.....	.....	478	421	113	.....
TOTALS, NORTH AMERICA	$40,947	$45,006	$17,922	$6,621	5,873	$15,039	26,996	$26,045	200,537	$159,850	$36,797	$26,328
SOUTH AMERICA												
Argentina	$8,323	$4,188	$2,154	.....	8,520	$10,280	2,940	$5,880	98,805	$59,587	$5,514	$23,865
Bolivia	730	.....	.....	.....	220	1,561	.....	.....	.....	.....	227	.....
Brazil	6,996	2,259	269	.....	.....	.....	11,635	7,025	4,322	2,103	.....	3,721
Chile	2,624	6,833	3,959	.....	480	1,000	720	220	236	182	.....	3,721
Colombia	1,258	1,926	791	.....	.....	.....	1,041	911	12,616	8,297	8,049	2,248
Ecuador	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	1,019	191
British Guiana	.....	64	.....	.....	.....	.....	.....	.....	192	125	.....	.....
Paraguay	.....	146	.....	.....	.....	.....	.....	.....	1,108	552	.....	.....
Peru	1,170	2,972	3,149	.....	144	733	96	292	702	741	195	52
Uruguay	630	820	601	.....	.....	.....	5,550	4,711	6,216	3,686	2,004	2,145
Venezuela	2,528	1,622	646	.....	.....	.....	35	32	1,116	815	4,126	613
TOTALS, SOUTH AMERICA	$24,259	$20,920	$11,569	.....	9,364	$13,574	22,017	$19,071	125,313	$76,088	$21,600	$33,088
ASIA												
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$2,924	$1,367	$37	.....	.....	.....	540	$699	8,386	$10,701	.....	$172
Ceylon	.....	215	.....	.....	.....	.....	.....	.....	.....	.....	.....	959
Straits Settlements	.....	.....	.....	.....	.....	.....	.....	.....	2,202	1,191	.....	.....
China	.....	325	335	.....	.....	.....	6,798	5,121	8,070	6,441	$156	1,502
Chosen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Java and Madura	3,752	1,317	1,316	.....	.....	.....	384	499	5,472	5,962	.....	3,400
Other British East Indies	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Dutch East Indies	114	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	408	399	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	32	40	.....	.....	.....	.....
Hongkong	.....	99	101	.....	.....	.....	1,800	1,485	1,747	1,819	.....	195
Japan	6,228	6,548	3,758	$14,867	.....	$847	24	22	.....	.....	.....	844
Kwangtung, leased territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,102
Palestine and Syria	.....	296	.....	.....	.....	.....	.....	.....	.....	.....	.....	163
Philippine Islands	3,351	3,495	1,332	.....	.....	.....	591	225	26,769	21,436	7,075	1,356
Siam	.....	34	.....	.....	.....	.....	.....	.....	30	44	.....	.....
TOTALS, ASIA	$16,369	$13,696	$6,879	$14,867	261	$847	10,169	$8,091	53,084	$47,993	$7,231	$9,693
OCEANIA												
Australia	$12,388	$6,562	$4,949	.....	482	$1,313	260	$152	.....	.....	.....	$4,564
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	24	$20	.....	.....
French Oceania	.....	.....	140	.....	.....	.....	.....	.....	1,224	1,175	$34	.....
New Zealand	130	1,129	1,052	.....	881	3,350	66	222	462	540	.....	294
Other Oceania	.....	28	.....	.....	.....	.....	.....	.....	646	648	.....	.....
TOTALS, OCEANIA	$12,518	$7,719	$6,141	.....	1,363	$4,663	326	$374	2,356	$2,383	$34	$4,858

United States by Countries During January, 1925

Waterproofed Outer Garments Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Solid Tires: Automobile and Motor Truck Number	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Tire Rubber Accessories, Repair Materials Value	Hard Rubber Goods: Electrical Supplies Value	Hard Rubber Goods: Others Value	Rubber Water Bottles and Fountain Syringes Value	Other Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
.....	11	$226	.....	$20	$11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,777	50,302	.....	4,908	.....	.....	.....	.....	.....	.....	$334	$452	$657	$176	$2,455
.....	30	405	.....	106	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	126	2,299	.....	135	.....	.....	.....	.....	$152	.....	.....	.....	.....	.....	.....
$24	5,396	59,964	$239	8,573	34	74	$1,860	.....	986	.....	.....	.....	1,399	3,502	.....
.....	52	927	.....	309	.....	.....	.....	.....	216	.....	.....	.....	.....	.....	.....
.....	1,063	22,119	.....	3,428	113	.....	.....	.....	6,904	$378	6,175	1,029	5,879	6,467	1,249
.....	664	28,574	.....	3,301	.....	.....	.....	.....	553	.....	.....	.....	460	200	3,710
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,718	23,230	.....	5,141	.....	328	10,640	.....	2,013	.....	.....	.....	.....	.....	57
.....	16	146	.....	61	.....	.....	.....	.....	9	.....	.....	.....	.....	.....	.....
.....	42	439	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	26	391	.....	7,426	.....	.....	.....	.....	271	.....	.....	1,079	.....	.....	308
.....	32	555	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....
.....	158	2,643	.....	481	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	100	925	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,451	22,234	734	2,933	164	55	649	.....	509	.....	375	124	2,156	751	11,463
.....	436	4,914	165	650	33	53	1,563	.....	522	.....	.....	205	556	.....	776
.....	4	114	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	297	3,643	.....	483	.....	.....	.....	.....	320	.....	.....	.....	.....	.....	.....
.....	10	140	.....	32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	720	.....	.....	.....	.....	.....	.....	.....	.....	110	.....	.....
.....	4,452	46,950	80	6,282	.....	186	4,976	.....	1,098	.....	212	285	354	.....	.....
.....	1,151	19,726	.....	1,669	.....	8	454	.....	13	96	.....	556	1,710	4,017	317
.....	301	5,153	.....	575	10	2	179	.....	.....	.....	.....	.....	63	1,135	.....
.....	.....	.....	.....	.....	.....	1	31	.....	.....	.....	.....	.....	.....	.....	.....
457	15,035	157,359	831	10,994	692	1,855	42,383	.....	11,886	2,933	50,612	2,797	22,958	10,718	48,826
.....	2,510	18,467	.....	2,407	.....	.....	.....	.....	368	.....	.....	.....	.....	.....	.....
.....	69	563	.....	161	.....	.....	.....	.....	130	.....	.....	.....	.....	.....	.....
$491	36,927	$472,408	$2,049	$60,805	$1,057	2,562	$62,735	.....	$25,955	$3,407	$57,708	$6,527	$36,302	$26,966	$69,161
$716	606	$8,674	$508	$1,139	$60	54	$1,928	$323	$15,724	$8,620	$8,730	$701	$9,493	$362	$4,996
.....	11	77	.....	50	.....	.....	.....	.....	.....	57	.....	.....	.....	.....	.....
223	74	1,102	.....	117	.....	.....	.....	111	.....	.....	22	48	78	.....	88
135	99	1,469	.....	16	.....	.....	.....	289	82	.....	32	16	182	.....	.....
876	68	1,099	.....	195	7	.....	.....	.....	19	44	197	24	79	.....	74
111	71	936	.....	70	.....	.....	.....	.....	.....	.....	8	28	126	.....	2
60	744	11,661	.....	1,423	51	24	893	422	215	.....	190	47	1,132	125	43
48	171	3,214	.....	643	12	12	422	.....	78	.....	.....	.....	59	.....	53
2,642	7,046	76,066	1,310	10,249	47	126	4,397	640	4,361	1,363	1,802	811	3,723	.....	3,055
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
324	.....	.....	.....	59	.....	.....	.....	.....	25	.....	.....	.....	53	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	.....	.....
.....	55	738	.....	86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
201	101	1,199	.....	209	.....	72	1,167	.....	217	.....	.....	.....	.....	.....	$45
.....	214	2,905	12	463	.....	18	471	.....	84	.....	.....	.....	.....	.....	.....
33	88	1,111	.....	635	17	12	247	.....	23	32	.....	.....	.....	.....	37
5,003	6,290	59,669	2,552	9,494	685	799	24,819	387	1,616	477	1,136	865	3,748	13	1,087
658	815	7,922	.....	3,309	.....	130	3,560	135	43	.....	172	.....	151	.....	.....
620	173	1,813	.....	270	.....	2	30	.....	75	.....	15	.....	.....	.....	.....
.....	98	1,389	.....	144	.....	14	520	.....	.....	.....	.....	.....	.....	.....	.....
30	337	5,790	3	673	.....	2	46	67	155	.....	16	.....	48	.....	35
.....	38	358	.....	42	.....	.....	.....	.....	.....	.....	.....	.....	26	.....	.....
$11,680	17,099	$187,183	$4,585	$29,286	$879	1,265	$38,500	$2,874	$22,717	$10,593	$12,320	$1,940	$18,912	$500	$9,515
$2,593	9,374	$103,129	$1,258	$15,628	$128	361	$10,231	$1,875	$5,018	$374	$497	$2,316	$6,245	$54	$3,472
.....	33	505	.....	138	.....	.....	.....	.....	.....	.....	.....	12	73	.....	31
2,033	7,753	70,633	76	4,216	.....	319	7,096	.....	252	735	1,742	286	1,104	100	158
3,337	881	11,386	.....	524	.....	.....	.....	526	72	.....	.....	143	1,372	.....	144
362	1,090	17,068	50	3,618	186	80	3,362	374	119	.....	19	302	841	.....	811
470	28	596	24	566	6	.....	.....	.....	96	.....	.....	.....	37	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	40	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3,416	823	12,322	.....	2,847	.....	20	1,056	.....	1,032	.....	.....	48	432	.....	958
2,589	2,659	39,137	.....	1,178	.....	44	960	.....	48	.....	134	225	912	.....	511
280	722	9,613	.....	1,296	48	20	390	88	185	.....	48	65	287	24	82
$15,080	23,363	$264,389	$1,408	$30,011	$368	844	$23,095	$2,863	$6,862	$1,109	$2,440	$3,397	$11,303	$178	$6,167
.....	42	$297	.....	$92	.....	.....	.....	.....	$16	.....	.....	.....	.....	.....	.....
.....	3,845	35,777	.....	2,088	.....	186	$4,754	$13,017	122	$55	.....	$701	$836	$25	$3,096
.....	1,780	19,679	.....	1,187	.....	49	1,082	215	102	.....	.....	.....	43	.....	.....
.....	100	1,595	.....	163	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,066	11,619	$776	559	$18	126	2,959	97	33	57	$49	487	987	652	.....
.....	125	1,077	.....	130	.....	.....	.....	.....	.....	.....	.....	.....	71	.....	.....
.....	696	8,197	34	922	109	383	8,743	.....	480	60	.....	.....	332	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28
.....	22	423	.....	69	.....	8	217	.....	36	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	65	575	.....	150	.....	.....	.....	.....	12	.....	.....	.....	630	.....	138
.....	35	1,034	.....	19	.....	.....	.....	.....	44	.....	.....	.....	151	87	745
.....	6,298	63,273	844	9,578	173	544	10,060	.....	376	.....	109	108	1,050	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	282	4,701	.....	674	.....	.....	.....	.....	465	.....	.....	.....	253	.....	.....
$1,140	4,850	53,490	326	9,890	157	505	10,993	3,853	1,310	.....	.....	653	927	.....	1,459
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$1,140	19,206	$201,737	$1,980	$25,521	$457	1,801	$38,808	$17,182	$2,996	$172	$158	$1,949	$5,280	$764	$5,466
.....	6,202	$95,807	$595	$13,186	$188	1,175	$32,080	$533	$3,166	$1,123	$45	$1,138	$3,793	.....	$1,854
.....	16	65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	14	186	.....	11	.....	10	431	.....	.....	.....	.....	.....	.....	.....	.....
$93	6,413	74,347	862	4,759	146	446	16,612	291	787	251	157	58	678	$11	329
.....	42	424	28	23	29	156	3,840	63	.....	.....	78	.....	.....	.....	.....
$93	12,687	$170,829	$1,485	$17,979	$363	1,787	$52,963	$887	$3,953	$1,374	$280	$1,196	$4,471	$11	$2,183

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth and Rubberized Fabrics Value
AFRICA												
Belgian Congo	$55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British West Africa	.....	$81	.....	.....	.....	.....	.....	.....	100	$18	.....	.....
British South Africa	1,903	16,147	$1,089	.....	30	$88	395	$288	1,167	1,435	$1,025	$821
British East Africa	2,480	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	142
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	260	35
Egypt	.....	112	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Algeria and Tunis	178	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	.....	.....	947	.....	.....	.....	.....	.....	24	17	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	72	91	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	592
TOTALS, AFRICA	$4,616	$10,340	$2,036	.....	30	$88	395	$288	1,363	$1,561	$1,285	$1,590
GRAND TOTALS	$172,677	$119,759	$58,485	$116,724	137,954	$282,065	89,854	$84,893	403,577	$286,437	$84,241	$103,114

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	January, 1924 Pounds	January, 1924 Value	January, 1925 Pounds	January, 1925 Value
UNMANUFACTURED—*free*				
Crude rubber	49,418,682	$12,155,178	73,692,047	$22,406,756
Balata	111,924	61,409	31,289	8,344
Jelutong or Pontianak	301,918	26,689	1,301,351	129,360
Gutta percha	111,778	15,807	207,178	31,392
Guayule	.....	.....	200,000	35,414
Rubber scrap	607,253	28,718	1,477,333	80,345
Totals	50,551,555	$12,287,801	76,909,158	$22,691,611
Chicle *dutiable*	1,097,877	$569,265	1,566,287	$777,036
MANUFACTURED—*dutiable*				
Rubber belting	43,399	29,804	50,349	40,077
Other rubber manufactures of substitute for rubber	.....	148,475	.....	91,331
Totals	43,399	$178,279	50,349	$131,408

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	1,947,306	$507,380	2,602,756	$963,593
Balata	45,586	19,127	126,900	78,660
Jelutong or pontianak	.....	.....	.....	.....
Gutta percha and rubber substitutes and scrap	50,414	1,811	.....	.....
Totals	2,043,306	$528,318	2,729,656	$1,042,253
Chicle	.....	.....	.....	.....
MANUFACTURED				
Gutta percha and India rubber	1,537	$1,407	10,439	$4,935
Totals	1,537	$1,407	10,439	$4,935

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	216,124	$18,924	790,938	$65,758
Scrap and old	1,152,763	40,229	2,498,886	122,839
Footwear				
Boots *pairs*	45,885	106,451	137,954	282,065
Shoes *pairs*	108,224	98,994	89,854	84,893
Canvas shoes with rubber soles *pairs*	190,723	153,647	403,577	286,437
Rubber water bottles and fountain syringes, *number*	6,326	6,091	24,888	15,372
Other druggists' rubber sundries	42,884	44,956	71,433	77,265
Bathing caps *dozen*	7,688	14,027	15,477	28,863

	January, 1924 Pounds	January, 1924 Value	January, 1925 Pounds	January, 1925 Value
Hard rubber goods				
Electrical hard rubber goods	29,353	14,406	34,759	16,655
Other hard rubber goods	24,635	29,846	78,246	72,906
Tires				
Pneumatic casings				
For automobiles *number*	72,426	866,651	112,017	1,330,847
Others *number*	4,132	20,094	3,189	11,363
Pneumatic tubes				
For automobiles	76,091	138,753	93,083	168,884
Others *number*	3,534	3,129	3,404	3,124
Solid tires				
For automobiles and motor trucks *number*	9,779	325,487	8,326	217,361
Other *number*	92,958	25,160	103,298	23,306
Tire accessories	64,848	23,144	150,910	63,829
Belting	252,233	148,139	283,327	172,677
Hose	433,396	169,472	325,805	119,759
Packing	156,458	69,435	130,400	58,485
Soles and heels	159,531	50,325	279,659	84,241
Thread	73,370	83,802	101,030	116,724
Other rubber manufactures	327,558	210,564	386,107	205,649
Totals	.....	$2,661,726	.....	$3,629,302

Imports of Crude Rubber Into the United States by Customs Districts

	January, 1924 Pounds	January, 1924 Value	January, 1925 Pounds	January, 1925 Value
Massachusetts	882,844	$209,549	3,061,520	$914,049
New York	47,189,488	11,655,545	65,582,742	20,122,938
Philadelphia	.....	.....	902,876	267,057
Maryland	.....	.....	1,288,004	330,890
Los Angeles	730,528	181,643	2,361,201	624,485
San Francisco	55,070	13,582	238,104	73,438
Colorado	.....	.....	246,400	70,288
Oregon	222,400	6,610	.....	.....
Washington	.....	.....	11,200	3,611
Totals	49,080,330	$12,066,929	73,692,047	$22,406,756

DURING THE PAST YEAR THE UNITED STATES EXPORTED 3,917,510 pairs of canvas rubber-soled shoes, the value being $2,962,069. The December figures were among the best for the year, 462,239 pairs, value $333,784.

United States Crude and Waste Rubber Imports for 1925 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1925	Total 1924	Balata	Miscellaneous	Waste
January *tons*	28,480	989	325	54	112	.....	29,960	21,611	22	1,462	206
February	21,740	1,203	120	224	163	6	23,456	31,763	48	908	241
Totals, 2 months, 1925 *tons*	50,220	2,192	445	278	275	6	53,416	.....	70	2,370	447
Totals, 2 months, 1924	50,588	2,232	373	181	...	.....	.....	53,374	70	1,048	148

Compiled from statistics supplied by the Rubber Association of America, Inc.

United States by Countries During January, 1925—*(Continued)*

Waterproofed Outer Garments Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Solid Tires: Automobile and Motor Truck Number	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Tire Rubber Accessories, Repair Materials Value	Hard Rubber Goods: Electrical Supplies Value	Hard Rubber Goods: Others Value	Rubber Water Bottles and Fountain Syringes Value	Other Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
.....	4	$233	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
$295	320	4,232	.....	$39	.....	.....	.....	.....	$120	.....	.....	.....	.....	.....	.....
1,926	1,177	17,667	.....	3,451	.....	29	$667	.....	1,117	.....	.....	$263	$915	$336	$1,939
.....	156	1,732	.....	154	.....	18	325	.....	.....	.....	.....	.....	33	.....	.....
.....	188	2,354	.....	130	.....	.....	.....	.....	.....	.....	.....	.....	49	.....	.....
.....	658	5,871	$56	1,100	.....	.....	.....	.....	.....	.....	.....	100	.....	108	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	20	268	.....	.....	.....	.....	.....	.....	.....	.....
.....	232	2,212	.....	334	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	74	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	109	.....	.....	.....	.....	.....	.....
$2,221	2,735	$34,301	$56	$5,282	.....	67	$1,260	.....	$1,346	.....	.....	$363	$997	$444	$1,939
$30,705	112,017	$1,330,847	$11,363	$168,884	$3,124	8,326	$217,361	$23,306	$63,929	$16,655	$72,906	$15,372	$77,265	$28,863	$94,431

United Kingdom Rubber Statistics

Imports

	January, 1924 Pounds	January, 1924 Value	January, 1925 Pounds	January, 1925 Value
UNMANUFACTURED				
Crude Rubber				
From—				
Straits Settlements	5,459,600	£334,644	4,867,800	£333,945
Federated Malay States	2,128,700	132,319	2,027,800	141,231
British India	893,700	57,561	1,170,600	77,502
Ceylon and Dependencies	1,659,000	103,813	2,242,700	144,927
Other Dutch Possessions in Indian Seas	258,300	16,408	1,061,700	75,255
Dutch East Indies (except other Dutch Possessions in Indian Seas)	1,883,800	118,498	1,678,800	107,464
Other countries in East Indies and Pacific, not elsewhere specified	46,800	2,728	80,900	5,930
Brazil	748,800	36,574	1,094,500	68,598
Peru	36,400	1,845	.....	.....
West Africa.				
French West Africa	95,100	3,325	150,700	7,561
Gold Coast	27,500	1,288	10,500	587
Other ports of West Africa	49,800	1,942	165,200	8,473
East Africa, including Madagascar	179,300	8,432	118,900	8,472
Other countries	7,000	390	89,100	6,652
Totals	13,473,800	£819,767	14,759,200	£986,597
Waste and reclaimed rubber	232,900	2,615	459,500	5,341
Gutta percha and balata	857,100	105,882	1,072,800	145,674
Rubber substitutes	.....	.....	11,000	31
Totals	14,563,800	£928,264	16,302,500	£1,137,643
MANUFACTURED				
Boots and shoes...*doz. pairs*	3,037	£13,053	23,177	£71,784
Tires and tubes				
Pneumatic				
Outer covers	.....	205,367	.....	199,032
Inner tubes	.....	49,137	.....	33,972
Solid tires	.....	18,868	.....	30,751
Other rubber manufactures	.....	88,865	.....	121,970
Totals	.....	£375,290	.....	£457,509

Exports

UNMANUFACTURED				
Waste and reclaimed	689,800	£6,230	1,289,600	£13,737
Rubber substitutes	108,000	2,104	135,400	3,506
Totals	797,800	£8,334	1,425,000	£17,243
MANUFACTURED				
Boots and shoes...*doz. pairs*	15,330	£25,743	24,483	£35,649
Tires and tubes				
Pneumatic				
Outer covers	.....	148,536	.....	184,621
Inner tubes	.....	28,254	.....	44,041
Solid tires	.....	24,188	.....	33,930
Other rubber manufactures	.....	221,743	.....	252,020
Totals	.....	£448,464	.....	£550,261

Exports—Colonial and Foreign

	January, 1924 Pounds	January, 1924 Value	January, 1925 Pounds	January, 1925 Value
UNMANUFACTURED				
Crude rubber				
To				
Russia	895,360	£50,361	745,700	£54,342
Sweden, Norway and Denmark	336,000	19,794	232,700	17,750
Germany	303,700	18,715	1,722,900	124,116
Belgium	307,100	16,534	536,900	41,424
France	3,083,600	180,788	3,256,800	255,023
Spain	53,900	2,630	50,900	4,043
Italy	754,500	43,920	1,607,700	123,709
Austria	.....	.....	7,300	631
Hungary	600	40	7,200	539
Other European countries	75,400	4,655	357,000	23,216
United States	8,819,800	525,707	6,183,000	458,788
Canada	1,063,400	67,446	565,200	44,317
Other countries	108,700	6,064	21,200	1,757
Totals	15,801,400	£936,654	15,394,500	£1,149,655
Waste and reclaimed rubber	20,200	359	3,600	87
Gutta percha and balata	64,200	6,711	113,700	7,143
Rubber substitutes	.....	.....	.....	.....
Totals	15,885,800	£943,724	15,511,800	£1,156,885
MANUFACTURED				
Boots and shoes...*doz. pairs*	146	£426	393	£1,265
Tires and tubes				
Pneumatic				
Outer covers	.....	16,036	.....	35,081
Inner tubes	.....	1,523	.....	4,464
Solid tires	.....	1,777	.....	2,123
Other rubber manufactures	.....	4,225	.....	10,475
Totals	.....	£23,987	.....	£53,408

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During January

	Landed for Jan. Tons	Delivered for Jan. Tons	Stocks, January 31: 1925 Tons	1924 Tons	1923 Tons
LONDON:					
Plantation	6,406	8,747	27,005	*57,112	73,370
Other grades	...	9	84	97	128
LIVERPOOL:					
Plantation	†430	†573	†2,579	†5,549	†8,007
Pará and Peruvian	163	132	172	593	328
Other grades	...	15	59	210	311
Total tons, London and Liverpool	6,999	9,476	28,899	63,561	82,144

* Adjusted for rubber destroyed by fire at Concordia Wharf.
† Official returns from six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
FEBRUARY 17. By "Justin," South America.					
H. A. Astlett & Co.	*20,160	*4,480	*56,000	.....	.....
MARCH 2. By "American Legion," Montevideo.					
Paul Bertuch & Co.	†144	.....	**26	.....	.....
MARCH 3. By "Bonheur," Pará and Manaös.					
H. A. Astlett & Co.	*8,960	.....	*17,920	.....	.....
Paul Bertuch & Co.	††7	.....	270	**83	.....
Paul Bertuch & Co.	5	.....	.....	.....	.....
General Rubber Co.	158	10	18	99	9
L. Littlejohn & Co., Inc.	351	43	256	25	.....
Meyer & Brown, Inc.	.....	.....	.....	266	.....
Poel & Kelly, Inc.	344	.....	308	14	.....
MARCH 10. By "Stephen," Pará and Manaös.					
H. A. Astlett & Co.	*76,120	*13,440	*22,400	.....	.....
Paul Bertuch & Co.	155	4	.....	2	.....
General Rubber Co.	157	29	123	248	73
L. Littlejohn & Co., Inc.	323	35	242	367	.....
Poel & Kelly, Inc.	281	18	150	781	.....

†Biscuits. **Bales. ††Crates. ‡Skins. *Pounds.

Plantations

	Cases
FEBRUARY 17. By "London Commerce," Europe.	
L. Littlejohn & Co., Inc.	3,717
FEBRUARY 17. By "Antonia," Europe.	
L. Littlejohn & Co., Inc.	2,143
FEBRUARY 18. By "Lancastria," Europe.	
L. Littlejohn & Co., Inc.	713
FEBRUARY 19. By "Silver Pine," Far East.	
H. A. Astlett & Co.	169
Hood Rubber Co.	161 pkgs.
L. Littlejohn & Co., Inc.	3,991
Meyer & Brown, Inc.	1,138
Mitsui & Co., Ltd.	80
H. Muehlstein & Co., Inc.	727
FEBRUARY 20. By "City of Rangoon," Far East.	
H. A. Astlett & Co.	633
H. A. Astlett & Co.	*80
General Rubber Co.	195
Hood Rubber Co.	*50 pkgs.
J. T. Johnstone & Co., Inc.	250
L. Littlejohn & Co., Inc.	2,336
Meyer & Brown, Inc.	846
Mitsui & Co., Ltd.	430
Poel & Kelly, Inc.	1,068
Chas. T. Wilson Co., Inc.	100
FEBRUARY 20. By "Kathlamba," Far East.	
Baird Rubber & Trading Co., Inc.	*150
Baird Rubber & Trading Co., Inc.	3,035
General Rubber Co.	20
J. T. Johnstone & Co., Inc.	626
L. Littlejohn & Co., Inc.	6,280
Meyer & Brown, Inc.	1,082
Mitsui & Co., Ltd.	452
H. Muehlstein & Co., Inc.	900
Poel & Kelly, Inc.	6,240
Vernon Metal & Produce Co., Inc.	756
Chas. T. Wilson Co., Inc.	541
FEBRUARY 23. By "Minnetonka," Europe.	
H. A. Astlett & Co.	16,240 lbs.
L. Littlejohn & Co., Inc.	547
Meyer & Brown, Inc.	64
Vernon Metal & Produce Co., Inc.	259
Chas. T. Wilson Co., Inc.	346
FEBRUARY 24. By "Median," London.	
Poel & Kelly, Inc.	135
FEBRUARY 24. By "Swazi," Far East.	
Baird Rubber & Trading Co., Inc.	268
J. T. Johnstone & Co., Inc.	554
L. Littlejohn & Co., Inc.	387
Poel & Kelly, Inc.	42
Vernon Metal & Produce Co., Inc.	160
Chas. T. Wilson Co., Inc.	106
FEBRUARY 25. By "Mississippi," London.	
J. T. Johnstone & Co., Inc.	374
Meyer & Brown, Inc.	649
Chas. T. Wilson Co., Inc.	66
FEBRUARY 26. By "Verentia," London.	
Baird Rubber & Trading Co., Inc.	150
General Rubber Co.	50
J. T. Johnstone & Co., Inc.	111
L. Littlejohn & Co., Inc.	289
Meyer & Brown, Inc.	419
Vernon Metal & Produce Co., Inc.	25
FEBRUARY 27. By "City of Hankow," Far East.	
General Rubber Co.	1,006
L. Littlejohn & Co., Inc.	2,091
Meyer & Brown, Inc.	213
H. Muehlstein & Co., Inc.	66
Poel & Kelly, Inc.	477
Vernon Metal & Produce Co., Inc.	56
Chas. T. Wilson Co., Inc.	539
FEBRUARY 27. By "President Harrison," Far East.	
Baird Rubber & Trading Co., Inc.	600
General Rubber Co.	99
Hood Rubber Co.	233 pkgs.
L. Littlejohn & Co., Inc.	1,388
Meyer & Brown, Inc.	2,859
Poel & Kelly, Inc.	444
Vernon Metal & Produce Co., Inc.	484
Chas. T. Wilson Co., Inc.	301
MARCH 1. By "Egremont Castle," Far East.	
Baird Rubber & Trading Co., Inc.	418
General Rubber Co.	3,468
Hood Rubber Co.	*225 pkgs.
L. Littlejohn & Co., Inc.	4,248
Meyer & Brown, Inc.	723
Poel & Kelly, Inc.	1,500
Poel & Kelly, Inc.	*301
Vernon Metal & Produce Co., Inc.	472
Chas. T. Wilson Co., Inc.	269
MARCH 1. By "Silver Cedar," Far East	
Paul Bertuch & Co.	369
L. Littlejohn & Co., Inc.	2,377
Meyer & Brown, Inc.	854
H. Muehlstein & Co., Inc.	220
Poel & Kelly, Inc.	409
Chas. T. Wilson Co., Inc.	92
MARCH 2. By "City of Shanghai," Far East.	
Paul Bertuch & Co.	358,400 lbs.
H. A. Astlett & Co.	*5,600 lbs.
Baird Rubber & Trading Co., Inc.	550
Baird Rubber & Trading Co., Inc.	*200
Hood Rubber Co.	*128 pkgs.
J. T. Johnstone & Co., Inc.	250
L. Littlejohn & Co., Inc.	5,089
Meyer & Brown, Inc.	1,811
Mitsui & Co., Ltd.	262
H. Muehlstein & Co., Inc.	100
Poel & Kelly, Inc.	3,547
Poel & Kelly, Inc.	*120
Vernon Metal & Produce Co., Inc.	317
Vernon Metal & Produce Co., Inc.	*50
Chas. T. Wilson Co., Inc.	81
MARCH 2. By "Celtic Prince," Far East.	
Baird Rubber & Trading Co., Inc.	2,858
General Rubber Co.	2,159
Hood Rubber Co.	*1,271 pkgs.
J. T. Johnstone & Co., Inc.	50
L. Littlejohn & Co., Inc.	10,428
Meyer & Brown, Inc.	2,163
Mitsui & Co., Ltd.	342
H. Muehlstein & Co., Inc.	2,400
H. Muehlstein & Co., Inc.	*360
Poel & Kelly, Inc.	1,102
H. A. Astlett & Co.	136,960 lbs.
Vernon Metal & Produce Co., Inc.	163
Chas. T. Wilson Co., Inc.	661
MARCH 1. By "Scythian," Europe.	
L. Littlejohn & Co., Inc.	*246
MARCH 2. By "Oanfa," Far East.	
Hood Rubber Co.	*92 pkgs.
L. Littlejohn & Co., Inc.	4,844
MARCH 3. By "Ansonia," Europe.	
H. A. Astlett & Co.	44,800 lbs.
Baird Rubber & Trading Co., Inc.	1,261
L. Littlejohn & Co., Inc.	1,245
MARCH 4. By "Aurania," London.	
Baird Rubber & Trading Co., Inc.	148
L. Littlejohn & Co., Inc.	176
Vernon Metal & Produce Co., Inc.	120
MARCH 4. By "Baltic," Europe.	
Baird Rubber & Trading Co., Inc.	195
L. Littlejohn & Co., Inc.	189
MARCH 4. By "Northwestern Miller," London.	
Chas. T. Wilson Co., Inc.	433
MARCH 5. By "American Farmer," Far East.	
H. A. Astlett & Co.	11,083 lbs.
L. Littlejohn & Co., Inc.	1,653
MARCH 5. By "Birchbank," Colombo.	
General Rubber Co.	1,058
L. Littlejohn & Co., Inc.	896
H. Muehlstein & Co., Inc.	66
Chas. T. Wilson Co., Inc.	308
MARCH 9. By "American Shipper," Europe.	
Baird Rubber & Trading Co., Inc.	509
L. Littlejohn & Co., Inc.	1,691
MARCH 9. By "Caronia," London.	
L. Littlejohn & Co., Inc.	477
Vernon Metal & Produce Co., Inc.	144
MARCH 9. By "Minnewaska," London.	
Baird Rubber & Trading Co., Inc.	443
J. T. Johnstone & Co., Inc.	938
L. Littlejohn & Co., Inc.	2,904
H. Muehlstein & Co., Inc.	94
Vernon Metal & Produce Co., Inc.	191
Chas. T. Wilson Co., Inc.	624
MARCH 10. By "Kanagawa Maru," Far East.	
L. Littlejohn & Co., Inc.	70
MARCH 10. By "Hyson," Far East.	
H. A. Astlett & Co.	235,200 lbs.
H. A. Astlett & Co.	*61,600 lbs.
Baird Rubber & Trading Co., Inc.	2,065
Baird Rubber & Trading Co., Inc.	*200
General Rubber Co.	3,563
Hood Rubber Co.	*445 pkgs.
J. T. Johnstone & Co., Inc.	100
L. Littlejohn & Co., Inc.	8,938
Meyer & Brown, Inc.	3,914
Mitsui & Co., Ltd.	336
H. Muehlstein & Co., Inc.	1,300
H. Muehlstein & Co., Inc.	*50
Poel & Kelly, Inc.	3,509
Vernon Metal & Produce Co., Inc.	200
Chas. T. Wilson Co., Inc.	1,834
MARCH 11. By "Maine," London.	
H. A. Astlett & Co.	5,000 lbs.
Baird Rubber & Trading Co., Inc.	449
Baird Rubber & Trading Co., Inc.	*21
General Rubber Co.	20
L. Littlejohn & Co., Inc.	1,185
Poel & Kelly, Inc.	700
Vernon Metal & Produce Co., Inc.	117
Chas. T. Wilson Co., Inc.	20
MARCH 15. By "Breedyk," Holland.	
H. Muehlstein & Co., Inc.	50
MARCH 12. By "President Van Buren," Far East.	
Paul Bertuch & Co.	265
General Rubber Co.	25
Hood Rubber Co.	*50 pkgs.
L. Littlejohn & Co., Inc.	1,021
Meyer & Brown, Inc.	325
Mitsui & Co., Ltd.	200
H. Muehlstein & Co., Inc.	160
Poel & Kelly, Inc.	1,134
H. Muehlstein & Co., Inc.	*132
Vernon Metal & Produce Co., Inc.	150
Chas. T. Wilson Co., Inc.	180
MARCH 14. By "Vechtdijk," Far East.	
H. A. Astlett & Co.	61,600 lbs.
Baird Rubber & Trading Co., Inc.	239
General Rubber Co.	664
Hood Rubber Co.	*150 pkgs.
J. T. Johnstone & Co., Inc.	562
L. Littlejohn & Co., Inc.	4,582
Meyer & Brown, Inc.	842
H. Muehlstein & Co., Inc.	138
H. Muehlstein & Co., Inc.	*238
MARCH 16. By "Ixion," Singapore.	
Baird Rubber & Trading Co., Inc.	2,134
Baird Rubber & Trading Co., Inc.	*200
MARCH 16. By "Vardulia," London.	
Baird Rubber & Trading Co., Inc.	787
H. Muehlstein & Co., Inc.	30
Vernon Metal & Produce Co., Inc.	225
Chas. T. Wilson Co., Inc.	63
MARCH 17. By "American Trader," England.	
H. Muehlstein & Co., Inc.	32
MARCH 17. By "Lancastria," Liverpool.	
Baird Rubber & Trading Co., Inc.	278
MARCH 17. By "Steel Inventor," Far East.	
H. A. Astlett & Co.	112,000 lbs.
Baird Rubber & Trading Co., Inc.	375
General Rubber Co.	6,889
Hood Rubber Co.	978
Meyer & Brown, Inc.	1,276
H. Muehlstein & Co., Inc.	1,200
H. Muehlstein & Co., Inc.	*300
Vernon Metal & Produce Co., Inc.	590

*Arrived at Boston.

Africans

FEBRUARY 23. By "Caucasier," Antwerp.
Poel & Kelly, Inc. ..... 23 barrels

FEBRUARY 25. By "Kinssillon," Brazil.
L. Littlejohn & Co., Inc. ..... 514 CASES

MARCH 9. By "Manhattan," Antwerp.
Meyer & Brown, Inc. ..... 220 CASES

Guayule

FEBRUARY 25. By "Pannco," Mexico.
Continental Rubber Co. ..... 1,620 CASES

FEBRUARY 18-MARCH 16. By "Railways," Texas.
Continental Rubber Co. ..... 2,000 CASES

MARCH 16. By "Mexico," Mexico.
Continental Rubber Co. ..... 1,680 CASES

Rubber Latex

MARCH 1. By "Egremont Castle," Far East.
General Rubber Co. ..... 165,318 lbs.

MARCH 1. By "Silver Cedar," Far East.
General Rubber Co. ..... 285,716 lbs.

MARCH 17. By "Steel Inventor," Far East.
General Rubber Co. ..... 205,185 lbs.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	December, 1924		Nine Months Ended December, 1924 April-December	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.,				
From United Kingdom	67,178	$23,042	3,405,325	$889,420
United States	2,579,047	799,899	17,831,534	4,481,493
Belgium	.....	.....	50,122	11,393
Ceylon	.....	.....	.....	.....
Straits Settlements	336,014	86,102	1,665,833	373,517
Dutch East Indies	.....	.....	78,474	19,855
France	24,449	5,264	24,449	5,264
Netherlands	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	3,006,688	$914,307	23,055,737	$5,780,942
Rubber recovered	323,076	30,041	1,912,407	181,999
Rubber powdered and rubber or gutta percha scrap	228,714	12,669	2,810,509	103,268
Balata	736	481	4,261	3,246
Rubber substitutes	19,573	8,339	538,796	148,633
Totals	3,578,787	$965,837	28,321,710	$6,218,088
PARTLY MANUFACTURED				
Hard rubber sheets and rods	14,160	8,672	142,222	67,959
Hard rubber tubes	.....	212	.....	10,032
Rubber thread not covered	11,213	12,261	66,799	71,489
Totals	25,373	$21,145	209,021	$149,480
MANUFACTURED				
Belting	.....	$9,223	.....	$122,809
Hose	.....	4,792	.....	84,854
Packing	.....	2,449	.....	30,086
Boots and shoes, *pairs*	20,407	21,235	128,324	128,616
Clothing, including waterproofed	.....	10,292	.....	123,292
Gloves	.....	992	.....	11,277
Hot water bottles	.....	2,108	.....	7,788
Tires, solid, *number*	1,013	2,379	6,466	55,292
Tires, pneumatic, *number*	3,936	36,038	41,480	472,937
MANUFACTURED				
Inner tubes, *number*	698	2,578	23,448	56,195
Elastic, round or flat	.....	16,028	.....	184,036
Mats and matting	.....	1,403	.....	14,564
Cement	.....	5,606	.....	35,565
Other rubber manufactures	.....	93,564	.....	1,129,823
Totals	.....	$208,687	.....	$2,457,134
Totals, rubber imports	.....	$1,195,669	.....	$8,824,702

Exports of Domestic and Foreign Rubber Goods

	December, 1924		Nine Months Ended December, 1924 April-December	
	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$22,668	.....	$83,125	.....
Totals	$22,668	.....	$83,125	.....
MANUFACTURED				
Belting	$26,039	.....	$299,616	.....
Canvas shoes with rubber soles	133,416	.....	1,394,335	.....
Boots and shoes	112,727	.....	682,834	.....
Clothing, including waterproofed	745	.....	19,743	.....
Hose	14,782	.....	119,997	.....
Tires, casings	472,315	.....	4,021,246	.....
Inner tubes	70,257	.....	661,657	.....
Pneumatic	.....	.....	.....	.....
Solid	19,596	.....	152,624	.....
Vehicle	.....	.....	.....	.....
Other rubber manufactures	41,065	$21,543	260,673	$113,051
Totals	$890,942	$21,543	$7,612,725	$113,051
Totals, rubber exports	$913,610	$21,543	$7,695,850	$113,051

Inventory, Production and Shipments of Tires in 1924

A comparison of the total 1924 figures with those of 1923 in the production and shipments of tires and tubes is of interest as showing the development of the industry. During 1924 there were 22,798,810 cord tires produced, as compared with 19,488,762 in 1923, while shipments of such casings during the past year amounted to 22,041,201, as against 18,806,446 in the year previous. Both production and shipments of fabric tires showed decreases for 1924, the figure for the former being 11,489,309 as compared with 14,455,174 for the year preceding, while shipments of these tires during 1924 reached a total of only 11,512,566, as against 15,087,041 for 1923. A similar falling off is evident in both production and shipments of solid tires, the 1924 output being estimated at 681,993, as compared with 692,148 in 1923, while shipments last year were 672,056 as against 736,124 in 1923.

Advances, however, appear in the figures for high pressure inner tubes, the 1924 production coming to 49,224,256 as against 45,128,083 for the year previous, while shipments in 1924 totaled 48,026,595 as compared with the 1923 figures of 44,303,941. Inventories of cord casings at the end of 1924 stood at 3,233,559. At the corresponding date a year ago the stocks included 2,934,772. Fabric tire inventories were 1,413,874 as of the end of December, compared with 1,394,528 a year ago. The stocks of inner tubes on hand at the end of the year totaled 7,418,729, compared with 6,318,446 at the end of 1923. Solid and cushion tires to a total of 191,620 were in the year-end inventory as against 178,088, December 31, 1923.

Balloon tire and tube figures have been in process of compilation only since March, 1924, the figure for the total production of these casings for the ten months being 4,428,074, while shipments amounted to 3,551,325. Inventory at the end of December, 1924, stood at 922,956. Production of balloon inner tubes during the March-December period reached 3,804,824, while shipments were 2,992,128. Inventory at the end of December was 870,383.

The total production during January, 1925, of cord, fabric, and balloon casings is estimated at 3,554,757, the figure for shipments being 3,089,744. The corresponding figure for the combined output of high pressure and balloon inner tubes was 4,757,055, while that for shipments stood at 4,182,374. The combined production during January of solid and cushion tires amounted to 52,464, shipments being 44,814. The total consumption during 1924 of crude rubber for the manufacture of casings, tubes, and solid and cushion tires is estimated at 453,845,546 pounds, while the amount of cotton fabric required for this production totaled 142,415,356 pounds.*

*All the above figures, as compiled by the Rubber Association, represent 75 per cent of the industry.

Inventory—Production—Domestic and Foreign Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	PNEUMATIC CASINGS				INNER TUBES				SOLID AND CUSHION TIRES			
	No. Mfrs. Reporting	Inventory Dec. 31	Production	Shipments	No. Mfrs. Reporting	Inventory Dec. 31	Production	Shipments	No. Mfrs. Reporting	Inventory Dec. 31	Production	Shipments
Twelve months, 1922	..	4,599,208	30,698,139	29,221,899	..	5,732,125	38,137,181	36,656,435	..	244,061	786,603	723,795
Twelve months, 1923	..	4,329,300	33,933,936	32,991,810	..	6,318,446	45,128,083	43,554,963	..	178,088	692,148	736,124
Twelve months, 1924	..	5,570,389	38,725,193	38,005,062	..	8,289,112	53,029,080	51,011,793	..	191,620	681,993	672,056
1925												
January	54	5,962,041	3,554,757	3,089,744	51	8,677,195	4,757,055	4,182,374	10	196,774	52,464	44,814

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and, as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" prior to January, 1924, includes only stock forwarded to a purchaser and not stock forwarded to warehouse, branch, on consignment basis, or abroad. After January, 1924, shipments abroad are included in these figures.

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